BULLETIN No. 53

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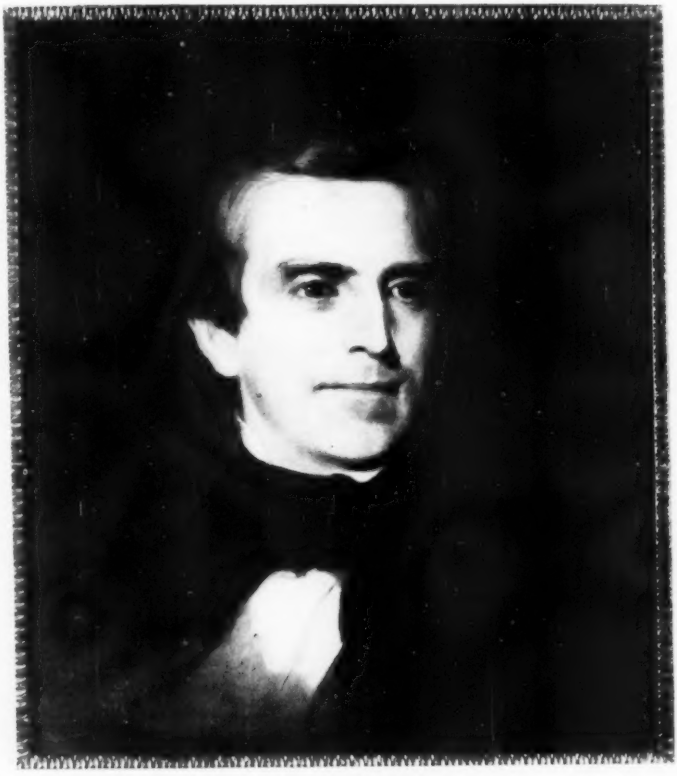


Moncure Robinson

The Railway and Locomotive Historical Society,
INC.

COMMITTEE IN CHARGE OF PUBLICATIONS.

Last Autumn your Editor visited a fine old homestead in New Hampshire where he spent one entire summer as a boy. The present owner of the property, a former playmate that summer, took him upstairs in the barn and pointed out the old track layout. Here was the bridge, here was the cross over and here was the loop. Not much was left but the enthusiasm of both, but it was recalled the value of old cigar boxes for making the tracks and the cars, spools sawed in two for the wheels and the bits and odds and ends that went to make up the construction of such a railroad. The boys had to contrive and build things for their own enjoyment and fun. This summer, the Society received from the sister of one of our members recently deceased, the wooden trains that her brother had made when a boy. They show considerable skill in their construction and great accuracy in their painting. This boy, like the former lad, knew the value of cigar boxes, wooden strips and his mother's empty spools. He had to contrive too in the construction of his railroad.

In the same way many of our members are using their spare time to best advantage in the matter of research work to help this Society. Not

all of our members, these days, have a great deal of time to spare—business ills and commercial affairs take toll of much of our time. It seems to your Editor, however, that an unusual number of our members have been devoting their talents in this direction. Daily contact with them through letters, material to be hunted up, data to be furnished, all are in the days work for ultimate appearance in our publication. Research work is slow work, no time can be set for its completion but these members engaged in this work—they contrive like the lads who built their wooden railways. So long as this spirit prevails the Society rests on a firm foundation.

In closing his comments your Editor calls your attention to further research work made by Mr. Kessler in the Jervis Library, we welcome a new contributor to our columns, Mr. Mills; Capt. Robinson has sent us another of his interesting contributions and Mr. Doherty has added something in his own north country. These with the additional material, we hope you will find of interest and we hope that their efforts will serve to stimulate others in the same direction.

Bulletins — Past and Future

This summer, as the extra bulletin, your Society published—"The Railroad in Literature." The author, Frank P. Donovan, Jr., has struck a new note in that he has given briefly a survey of the railroad in fiction, poetry, songs, biography, essays, travel and drama in the English language. So far as your Editor is aware, this is the only attempt of this kind that has ever been made. In this bulletin will be found brief sketches of the lives of the authors and their works—Spearman, Warman, Packard, Hamblen, our own "Ed" Hungerford and others, are all there. In each division will be found a list of the works of the various authors in addition to those that have been discussed. While it is true this may be a bit of a departure from the subjects covered by our extra bulletins during the preceding years, the work merits your attention. To have cut or divided the material so that it could be sold at the usual price would have ruined the work—hence the increase in price. We simply call your attention to this outstanding publication, the edition is limited and if you wish a copy for your library, now is the time to procure one.

Bulletin No. 54 which is the special bulletin for 1941 will be ready in January. The subject—History of the Wisconsin Central R. R., the author—Roy L. Martin, for many years employed by that road. An interesting and extraordinary chain of circumstances will make this bulletin of unusual merit and interest. We can't tell you all about it here but you will learn about it when you receive your copy. This bulletin will not be included in the dues of our Annual Members but if you wish a copy, the price, $1.00, should be added to your membership dues when you remit them to Mr. Walker.

Lastly, one of our members is working up the history of the old Denver, South Park & Pacific R. R. He has already received assistance from some of our members but there are still some facts to be uncovered. Any of our members who have any data or who are able to help or donate anything in any way, will they kindly get in touch with Mr. M. C. Poor, 4883 1/2 North Paulina Street, Chicago, Illinois. Credit will be given where due, no copies will be taken of any pictures loaned, the Society always has been against this promiscuous habit of copying pictures anyway, and prints will be returned to their original owners. Anyone interested in helping should please get in touch with Mr. Poor.

J. Frank Cook

By Annie M. Shedd

Among the more numerous of the families who came to New England before 1700, we find the name Cook. It is an occupational surname, the name having been derived from the office or calling, but I know of no one in our generation who followed it.

J. Frank Cook, born in Nashua, N. H., August 20, 1849, son of Aldrich Barton and Julia Knight Cook, traces his ancestry to Walter Cook who settled in Weymouth, Mass. in 1643, removing later to Mendon, Mass.

His grandfather was Captain Caleb Cook, said to have been a very intelligent, enterprising man of his day, with an inventive mind. There are papers dated March 7, 1854, signed by the Secretary of the Interior, Robert McClellan and countersigned and sealed with the Seal of the Patent Office, granting Letters Patent for "a new and useful Improved arrangement of valve motion for Locomotive Engines."

From his grandfather, no doubt my father inherited his interest in machinery and engineering. He too, lays claim to an invention which, although not patented, was found on many locomotives of the country. The guide cups in use at that time were rather expensive and could not be depended upon for any length of time, as they would either feed too much oil or not enough, because the threads would get worn. An idea came to him that if a wick were put into a tube and placed in a cup, it would feed the oil sufficiently to lubricate the guides. On testing, this proved correct and they were used on the Concord R. R., the Boston and Maine, and other roads. Black oil had just come into use and it was not of uniform weight and would not always feed the same but this wick seemed to equalize it. Being adopted and put in general use seemed proof of its worth.

His father, Capt. A. B. Cook, was for a number of years baggage master on the Concord R. R., later station agent on the Northern R. R. at Andover, N. H., until the breaking out of the Rebellion. He enlisted and recruited Company E of the 10th New Hampshire, which he commanded until after the battle of Fredericksburg, when on account of disability, he was discharged and entered the Provost Marshal's office in Concord, N. H. His son takes great pride in relating that he too was in the same office for about a year. Although but a boy at the time, his stories bear evidence of how indelibly the happenings of those days were impressed on his mind, and he is able to relate the stories these many years after.

He received only an elementary education in the schools of Concord, but as he was an apt scholar, a deep thinker, and a great reader, with a receptive mind and retentive memory, he has continued his learning all through life. Boys of his generation did not have the advantages and privileges of a higher education which those of the present day have, and were allowed to go to work at an early age. He was but sixteen when he found employment at the Concord R. R. freight house, going

from there to the Ford & Kimball foundry, serving nearly all of his apprenticeship. In passing, would like to make mention of the great respect and esteem he always had for the late Hon. B. A. Kimball, who always spoke of him as "my boy." From the foundry he went to Nashua, pulling pins in the Nashua Yard, and in a short time went on the footboard as locomotive fireman on the old Concord R. R. From there he went to the Worcester and Nashua and was set up as a spare engineer. Records show he entered the service in July 1869, serving the different managements, Concord R. R., Concord & Montreal, and ultimately the Boston & Maine. He moved to Concord, N. H. in 1879, and during his years of service ran both freight and passenger trains, and for many years to the time of his retirement was engineer on the "Cannon Ball" Concord to Boston.

While doing spare work, he had the pleasure of "breaking in" many of the new locomotives before they were put in regular service, and he was always proud to receive the commendation from the late Aretas Blood of the Manchester Locomotive Works.

He ran many special trains and I recall the Famous Flour train, Minneapolis to Boston, which was the first through train over the "Soo" road. The cars were gayly decorated and bore many inscriptions, among them "The greatest milling center to the greatest money center," "First through train from the Mississippi to the Atlantic north of Lake Michigan," "Minnesota sends greetings to Old New England." His engine, the Tahanto was decorated with flags.

One of his most pleasant assignments was running the monthly pay car "Webster" over the Concord R. R. bringing happiness and good cheer to the many employees on main line and branches. An incident is recalled that happened on the North Weare branch. The locomotive was disabled by the breaking of a driver-shaft seven miles from any telegraph office, but the part was jacked up and a sleeper put under so that the locomotive brought the car into Concord without any assistance.

Fifty six years on the footboard of a locomotive is a record of which he is justly proud. It means fifty-six years of hard work, application to duty, strict adherence to rules and regulations, and a great responsibility. A recent cartoon showed a small boy looking up at the engineer in the cab of a locomotive, with the caption "What does it take to be an engineer?" Well, it takes far more than the average person ever realizes.

My mother was Mary L. Moores of Concord, and the last years of her life were passed in darkness. Considering her wishes, in 1929, a few years after his retirement, they moved to Burlington, Vt., where he could see Lake Champlain and have a garden. Gardening has been his hobby and until failing eyesight deprived him of working, he passed many pleasant hours in company with his flowers. He has urged others to start a garden instead of standing on street corners. "Let them go into the garden and they will see a vast difference in their feelings" he once wrote Dr. Robert J. Graves, Chief Surgeon of the B. & M.

"What a wonderful time is Life's autumn
When the leaves of the trees are all gold
When God fills each day as He sends it
With memories priceless and old
What a treasure-house filled with rare jewels
Are the friendships of year after year."

On August 20, my father reached his ninety-first birthday, and to have made friends, made them and kept them, not only his fellow workers, but to have had the respect and confidence of his superior officers and to know they were and are his friends has been heartening to him in his declining years. While his eyesight permitted he enjoyed a large correspondence. He not only appreciated receiving letters but took much comfort and pleasure in writing.

In closing will quote from a letter he wrote after he had passed the 86th mile post in life.

"Time does not count on the other side of the Great Divide, but the acts of this life still hold good as we sign off at the Terminal Station. I hope I will be called upon to face only green lights to the end, and by no acts of mine will any of my friends I leave behind have cause to regret they made my acquaintance."

Editor's Note: In the spring of 1936, J. Frank Cook was made an Honorary Member of this Society. Serving on the old Concord R. R., later the Boston & Maine, he retired to Burlington, Vt. to spend his remaining years. Fortunate was your Editor to have his recollections and his notes in the preparation of the list of Concord R. R. locomotives in our Bulletin No. 35. Altho' he has not passed as many milestones as John Leonard Driscoll, we are honored to have him in our midst and the account of his life by his daughter will be welcome to our membership.

Letters of John B. Jervis

By William Conrad Kessler

(During the past summer, Mr. Kessler, assisted by his wife, has gone through the Jervis letters now in the Jervis Library at Rome, N. Y. The notes from the following letters touch on the Delaware & Hudson Co., and are a continuation of those that appeared in our Bulletin No. 52. Further evidence is shown that the name of the Stephenson engine was the "Pride of Newcastle." Whether the name of the third engine was or was not "Rondout" and what the name of the fourth engine was, we are still uncertain. However, these letters are submitted for the opinion of our readers and you are at liberty to draw your own conclusions. Acknowledgment is due to the kindness of Miss Helen Salzman, Librarian of the John B. Jervis Library for her assistance and her permission to copy and reproduce these manuscripts.)

Jervis to Judge Wright, March 31, 1825 (copy).

"At present prospect I am much inclined to think a rail way from the mines to Keama will be the best course."

(Wright was for a short time chief engineer for the Delaware and Hudson Canal and after resigning supported Jervis' plan for a railroad from the mines at Carbondale down to the Lackawaxen Creek).

Unsigned to Jervis, Canaan, Pa., August 17, 1826.

"From what I *saw* of Water and what I *heard* of it, I concluded *Canalling* was out of the question, and my further surveys were directed to a ***Rail road.***"

("Unsigned" was evidently an assistant engineer working for Jervis.)

Judge Wright to Jervis, New York, Jan. 16, 1827.

"As you justly observe, you will find it a much more difficult matter to locate a Rail Road over such ground than a Canal over common ground. So many variations by changing the inclinations of different parts of the Rail Way and varying the Plan by more or less Stationary Engines—or a thousand other variations. . . ."

"You no doubt see accounts of the Mauch Chunk Rail Way and I should advise you before you make a final location to look at that and get any new ideas that may suggest themselves to your mind."

"In making a Rail Way of wood you have a great advantage and therefore it is a less evil if on the country being opened hereafter it shall be found that the route may be bettered."

"The Rail of wood will last about 8 or 10 years and thus you can replace them by a new one laid in a better place if it shall be found that it can be bettered."

Kemble of West Point Foundry to Jervis, September 5, 1827.

". . . the West Point Foundry Assoc'n consider themselves as well or better qualified to furnish you with all descriptions of Machy, Castings and work connected therewith, including, Steam Engines wt. Iron or Brass, as any other establishment in the United States . . ."

He goes on to state that they employ 100 men at the foundry and 150 at the steam engine factory and fitting up shops in New York City. Their work for the Navy and Ordnance Departments has given them good experience for making castings.

Pres. Bolton of D. & H. to Jervis, N. Y., Nov. 7, 1827.

"I send Mr. Wurtz today copy of a resolution of the board authorizing contracts for timbers for the rail road adapted to Locomotive Engines. . . . Mr. Renwick informed us that your plan of rail road accords with that which has been decided upon from Albany to Schenectady and that opinions in England are now decided against the use of Cast Iron rails, and I mention for your consideration that he expresses doubts of your proposed plan of fastening the iron plates on the wooden rail on acct. of the contraction and expansion of the iron. He says ? has invented a mode of fastening which obviates the difficulty but as he was about taking out a patent for it he (Mr. R.) could not with propriety describe it."

(Renwick was a member of the faculty of Columbia College and also on the board of directors of the Mohawk and Hudson Railroad. He read and approved Jervis' plan for a railroad).

Pres. Bolton to Jervis, N. Y., Dec. 15, 1827.

"I have ascertained that English rolled iron can be imported including all charges at 85 59/100 Dollars a Ton."

Jervis to Horatio Allen (copy), undated.

"It is determined by the Board of Managers that you procure from England one locomotive engine with carriage complete for work. The 3 others that will be wanted is to depend on the cost at which they can be obtained, delivered at New York. It is supposed they can be obtained of American manufacture for $1800 and I presume it will not be economy to purchase them from England at a greater cost, unless you perceive a superiority in the workmanship of English engines, that in your opinion will justify the additional cost."

(According to an article by Allen in the "Railroad Gazette" of 1884 he was ordered to buy three engines, not four as stated here. It is interesting that it was considered even possible at this early time to have engines built in the U. S., although $1800 was too low an estimate.)

Bolton to Jervis, N. Y., April 30, 1828.

"A Bill has passed the Senate remitting all Duty on Iron and Machinery for rail roads. Its fate is uncertain in the House of R. but one of the Senators writes me that he is assured that it will be strongly supported in the House. This would be a windfall of at least $8000 to us. Please mention this to Mr. Wurtz."

(The bill was passed by Congress in 1832).

Bolton to Jervis, N. Y., May 9, 1828.

"From Mr. Allen's quotations of prices of waggon wheels & axles it appears to me that we shall find it most advantageous to get them made in this Country unless the Bill exempting railroad Iron & Machinery passes the House of Representatives & I have some fears that it will not pass, owing to the lateness of the Session as the Iron Makers will fight it hard.

"In his last letter Mr. Allen says nothing of the comparative advantages of fixed and revolving axles. The latter is most approved by Mr. Stephenson."

Treasurer Flewelling to Jervis, N. Y., Oct. 30, 1828.

Introducing E. L. Miller, one of the directors of the Charleston & Augusta Rail Road, "just returned from England and desirous of inspecting work on this line."

Jervis to Bolton, Honesdale, Dec. 25, 1828 (copy).

Jervis suggests that tolls should not be too high, otherwise competition of other canals and railroads from the Pennsylvania mines to New York may be encouraged. "I am fully of the opinion that the interests of the company will be better consulted by encouraging a business equal to the demand, than by obtaining a greater price for a less quantity."

(Jervis was evidently a capable economist as well as a good engineer.)

Bolton to Jervis, N. Y., Dec. 26, 1828.

"Judge Wright is also here. Mr. Allen remains this winter in the City & will see you when you come in. He suggests the putting up the locomotive engines here to ascertain whether they are all right believing that deficiencies if any would be best supplied here and that they might be taken up whole, there would be, I think, some difficulty in managing such heavy machinery & I suggested that you had a man at Carbondale who I believed was a skilful workman and has proposed to have this matter to be decided after you come down."

(According to the Allen article above cited, one engine of each type was put on blocks and tried out in New York).

Flewelling to Jervis, N. Y., Jan. 20, 1829.

"The Locomotive Engine made by Stephenson & Co., which is the more expensive one, has arrived."

From a pamphlet by a Mr. Bradish of the New York Legislature (?) supporting the $500,000 state loan to the D. & H. Co., 1829.

"The company have also been at the expense of having constructed, and have introduced into this country the first and only locomotive engines as yet known here . . . so that the company's rail-road will present for the study of the American engineer, and for the use of the public, a perfect model of this means of internal communication."

(The historical significance of the locomotives was fully appreciated in 1829. The fact that their importation was made possible by a loan of the state is usually neglected by historians).

Statement by Bolton to show the purposes for which the state loan was required. Jan. 26, 1829.

For Present Year	
5 stationary engines, fire-brick, cement & putting up	$25,000
4 locomotive engines, cost, duties and charges	13,400
160 rail-road wagons	16,000
For 1830	
Two additional locomotive engines	6,700
For 1831	
One additional locomotive engine	3,350

(At least as far as the public treasury was concerned, this reveals quite a bit of optimism over the anticipated performance of the engines).

Bolton to Jervis, N. Y., May 13, 1829.

"One of the Locomotives were to be shipped on the John Jay then in Liverpool & she is daily expected. The other two are promised one in 3 & the other in 5 weeks from 8 April. They pretend that an accident to their works has caused the delay so I yet hope they may reach us in time."

Bolton to Jervis, N. Y., May 20, 1829.

"The 2nd Locomotive was got to Kembles today & Mr. Allen has both going up. Mr. K. is making same very handsome ? they weigh 224 lbs. Mr. Allen has an application for a Survey for the Lycoming Coal Co., but I have said to him to day that we could not dispense with his services until the Locomotives are in operation . . . "

Allen to Jervis, N. Y., June 23, 1829.

Suggests $1 per day as satisfactory pay for a locomotive engineer. Also suggests they have on hand a "good supply of hard wood charcoal" for the locomotives.

Allen to Jervis, N. Y., June 25, 1829.

"I am having 6 feet more of chimney to the Pride of Newcastle."
(This is the second mention of one of the two Stephenson locomotives by name. The other was in Allen's letter of June 22, which was published in Bulletin No. 52).

Flewelling to Jervis, N. Y., July 2, 1829.

"Mr. Allen is putting the Locomotive Engines on board the Congress that goes up to day and he goes in her to Kingston."
(In the article before referred to, Allen said only the "Lion" was sent to Honesdale).

Flewelling to Jervis, N. Y., July 9, 1829.

"The President having stated that in a conversation with you on the subject of providing against the non-arrival of the Locomotive Engines, that you was (sic.) of opinion that a Horse-path could be made on the summit, and the 2 Engines could be placed on the other planes . . the arrival of the packet of the 1st of June is daily expected and she will very probably bring some further information of the Locomotive Engines."
(More evidence that four and not merely three engines were ordered).

Allen to Jervis, N. Y., July 15, 1829.

"The 3 packets now due which I think must contain the other two Engines." Mentions accepting a position with the Charleston & Augusta for $3600 a year.

Jervis to B. Titus, August 1, 1829.

Titus is hired as a locomotive or stationary engineer for $30 per month with house and fuel.

Jervis to Bolton, August 1, 1829 (copy).

"The Locomotives have been got out without any injury of consequence & we shall probably be able to make an experiment with the Lion on Monday or Tuesday next. Let the rigging come up with the next Locomotive as it is difficult to find that here strong enough to work with safety."

Bolton to Jervis, Kingston, August 6, 1829.

"Rastrick says the last Engine should be sent off in 10 days from 13 June and speaks of important improvements."
(Further evidence that Foster, Rastrick & Co. of Stourbridge made another locomotive for the D. & H. Co. besides the "Lion.")

Bolton to Jervis, Sept. 5, 1829.

"Strange to say, the Rondout is not yet here altho I have a letter from Messrs. Townsend saying she had been tried, performed well and would set off on Saturday afternoon or Sunday morning."

(Important question: Was "Rondout" the name of the third locomotive?)

Bolton to Jervis, Kingston, Sept. 10, 1829.

"The 3rd Locomotive came in here I shall put in a Shore fence and cover it."

(Was this the "Rondout" of the preceding letter?)

Bolton(?) to Jervis, N. Y., Sept. 19, 1829.

" . . .I now hope you will be able to commence a regular business next week, it is important to show this fall to our friends and enemies what we can do—the friends of the Lehigh and Morris Canal—and a host of others—take advantage of every opportunity to discredit our work—you see how sensitive some of the stockholders are, when so small a defect as that in the rail road when compared with the magnitude of the work, caused a fall in the stock equal to $150,000 on the whole.

The expenditures on the canal rail road and its appendages have much exceeded what I had estimated and the receipts from the coal business will not to the extent anticipated supply the funds. I therefore consider it very important that you should be able to show, to the numerous persons who intend to visit the work next month as well as by the arrival of the coal here that our work is not a visionary project."

Allen to Jervis, Sept. 27, 1829.

"I dined with Mr. [Phillip] Hone yesterday. He is in much better spirits than I expected to find him as to D. & H. Would you think it? He thinks of making his eldest son an Engineer! It shows that he has seen but little of an Engineer's life."

(Phillip Hone was a famous New York figure, the first president of the D. & H. Co. and a Mayor of New York. Honesdale was named after him by the Co.)

J. W. Bloomfield to Jervis, Rome, N. Y., Oct. 28, 1829.

"Your letter of the 19th inst. is received and very much gratified to hear that you are succeeding so well on your rail road. You might have reasonably expected that the failure of your locomotive plan would be charged to your acc't. but if your works stand well for horse power the public will soon be convinced that the failure was not of much consequence & that under all the circumstances that no censure or blame could attach to you. But I cannot help feeling anxious about your wooden rail ways. I am afraid (sic) they will not endure or last long. I am

apprehensive that the pressure of even your coal waggons will displace the iron on the wood after being in use a short time."

(Bloomfield was an uncle of Jervis).

Jervis to Allen, Honesdale, Pa., Jan. 19, 1830 (copy).

"Archbold [assistant engineer] is in good faith of surmounting difficulties & as soon as we can see things in a fair motion on the planes etc. I shall recur to the locomotive subjects."

(But compare the letter of Dec. 13, 1830, published in Bulletin No. 52).

In connection with Mr. Kessler's notes in Bulletin No. 52 come these interesting comments from our member—Mr. L. B. N. Gnaedinger:

"Mr. Kessler's article on the Jervis Library reminds me that there is a point about the history of the early D. & H. engines which no one has made, although of course, a great deal has been written about the "Stourbridge Lion" and its three mates. Here is my point:

"Horatio Allen was familiar with the structure of the D. & H. line and, indeed, its deficiencies are indicated by his instructions to have the locomotives weigh no more than 5½ tons if on four wheels. Since no six-wheel locomotives were bought, so far as we know, we can disregard their specification. Despite his own knowledge and his instructions, he bought the "Lion" although it weighed more than specified. Why he did this, never has been explained. It certainly was a curious action for an engineer. Perhaps, since he was enthusiastic about the locomotives, he thought the company would strengthen the tracks. This was not done, of course, and, as we know, he ran the engine into the woods so as not to endanger any other life. This trial trip did not persuade anyone to strengthen the tracks because it never went on the main line again, although one version has it that it did some switching service later.

"Here we have the spectacle of Allen having bought four locomotives for a new and presumably struggling company which could not use them. Is there any wonder that no one knows what happened to the three other engines? It is safe to say that after this waste of money Allen and all concerned were glad to have them drop quietly from sight. They probably would have been relieved if they had fallen overboard on the trip up the Hudson and have yielded some claim or insurance proceeds.

"Significant is the remark of Allen quoted by Mr. Kessler on page 47 of the bulletin where he states: 'The Locomotive will I think fully answer our expectations *when we get the road firm enough to bear it.*' (Italics mine).

"If Allen thought to force the hand of the management and have it strengthen the road sooner and wipe out its investment in the engines, he was wrong. Small wonder that, under the circumstances, everyone forgot the whereabouts of the locomotives as quickly as possible.

"So, to my mind, the mystery of the "Stourbridge Lion's" sisters is no mystery at all—merely another example of the truth that individuals and corporations like to bury their mistakes as quickly as possible. Indeed, on page 47 Allen admits his mistake in these words:

> 'An ardent desire * * * led me to a proposition that a more prudent regard for my own reputation and the interest of the company would probably have prevented.'

"Ironically, Allen's mistake brought him fame as having been the first man to drive a locomotive in America. When, years later, interviewers sought him out he must have realized that the lack of 'prudent regard' had made his reputation. I seem to recall reading that Allen in those later years gave somewhat varying accounts of his experimental run. A man who found his mistake hailed after a lapse of time as an achievement might well have had difficulty in recalling in detail what previously he would have liked to forget and in adjusting his mental attitude to the change."

From that indefatigable student of early locomotives and railways—Mr. C. F. Dendy Marshall, came a suggestion that the statement made on page 45 relative to the arrival of these engines be clarified. Both engines, the "Stourbridge Lion" and the "Pride of Newcastle," journeyed from the respective builders on separate vessels to New York City. Here, at the West Point Foundry they were assembled and probably shipped to Cold Spring on one of the ships of the "Cold Spring Navy." From that point they were shipped together to Rondout and thence taken up the canal to Honesdale. The statement on page 45 refers to the arrival of both engines at Rondout—not at New York City.

Moncure Robinson

By Chas. E. Fisher

Moncure Robinson, eldest son of John Robinson and Agnes Conway (Moncure) Robinson, was born in Richmond, Virginia, February 2, 1802. He received his education at Gerardine Academy and William and Mary College. He was educated for the law.

In 1818, the Board of Public Works of Virginia authorized a topographical survey and a connected line of levels from Richmond to the Ohio River. Young Robinson became enthused on the project and, putting aside his law books, asked to join the party. He was refused on account of his youth, but, nothing daunted, he accompanied the party as a volunteer, serving without pay. It was on this survey that he made his accurate notes of the coal deposits in what is now West Virginia. Although his father was a merchant of Richmond, he owned many lands in the northern part of the state. In 1819 young Robinson made a reconnaissance survey of these lands. Two years later we find him employed in locating the extension of the James River Canal in Virginia.

A visit to the Erie Canal convinced him that railroads were the most superior mode of transportation. Realizing his deficiencies in training, although his experience always stood him in good stead, we find him in Europe from 1825-1828 attending lectures on mathematics and science and studying public works.

Upon his return to America in 1828 he was called upon to make a survey of the Pottsville & Danville Railway to development the anthracite fields of Pennsylvania. We find him connected with the Allegheny Portage Railway, that state owned road built over Allegheny Mountain. Three years were spent building the Petersburg & Roanoke and the Richmond & Petersburg roads in his native state. He built the bridge over the James River having 19 spans, 60 feet high and a total length of 2844 feet.

In 1834 he started work on the Philadelphia & Reading R. R. No one who has travelled over this road, with its easy grades can deny the skill of the engineer. Moncure Robinson's survey and construction made possible the work of the "Gowan & Marx" and all that followed possible. It was on this survey that he formulated three fundamental rules for determining grades and curvatures. His masterpiece was the construction of the 1932 foot tunnel and stone bridge of four spans, each 72 feet long, at Phoenixville.

In 1839 he made the survey of a railroad from Brunswick, Georgia to the Gulf of Mexico and this and other surveys kept him busy until he retired in 1847. He declined service for the Czar of Russia in the construction of the St. Petersburg-Moscow R. R.

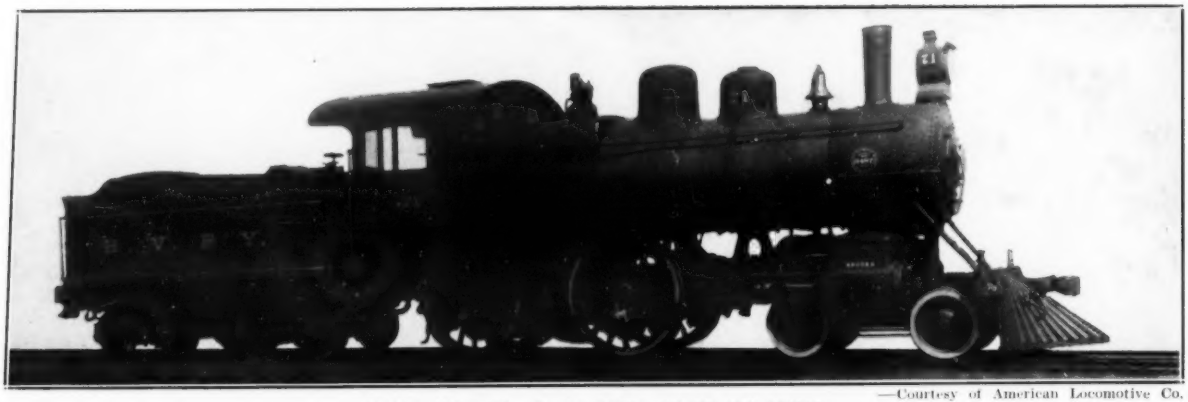
On his thirty-third birthday he married Charlotte Randolph Taylor, daughter of Bennett Taylor, a member of the Richmond, (Va.) bar. Five sons and five daughters were born of this marriage, all surviving him but two of the daughters.

Moncure Robinson was of the old school of Civil Engineers. The exactitude of the science, as we know it today, was unknown in his time. He had to work out his technique in the best school known—the school of experience. In the thirties, he tried to form a society of civil engineers but the men of that profession were not ready for it then. When the American Society of Civil Engineers was formed, he worked for its success and was honored with an Honorary Membership.

Moncure Robinson will always be remembered as one of our pioneer civil engineers, not trained at West Point as were Whistler and so many of the others. His greatest work was the construction of the Philadelphia & Reading R. R., but no one can read the report of the Petersburg & Roanoke R. R., wherein he recites the trial run of the tiny locomotive and he watched it as it sped along the track and vanished far away in the distance—"a beautiful object of energy almost sentient!"

It was to Philadelphia he turned upon his retirement and here, surrounded by his family and his friends, engaged in his own affairs he lived until November 10, 1891.

Through the kindness of Beverly Robinson of New York, Miss Lydia S. Moncure Robinson of Paoli, Pennsylvania and the other grandchildren, the Society has received a beautiful portrait of this distinguished American. The original, painted by Sully, hangs in the home of Beverly Robinson. The reproduction shows frankness but with sincerity of purpose—a gentleman of our last century, one of our pioneer engineers of whom we well may be proud.



—Courtesy of American Locomotive Co.

Hocking Valley 71. Brooks, 1900. 18x26" 72" 124000.

Hocking Valley Railway

By Winfield W. Robinson

Of the eighteen independent steam railroads radiating from the city of Columbus at the turn of the century there was one that, viewing the scene forty years later, may be said to stand out prominently from all the others. Its field was the great mineral district of the state and its mileage confined entirely to Ohio, although it connected with every other large railroad touching or crossing the state. This was the Hocking Valley system, a "soft-coaler," appropriately called the "Buckeye Route," a railway of more than 300 miles, all within the confines of the Buckeye State. It was the longest line of independent railway in the state of Ohio and occupied a central position from the Ohio River to Lake Erie, passing through the capital, with branches in the populous regions of the coal field.

April 14, 1864, the *Mineral Rail Road Company* was incorporated to build a steam railway from Columbus to Athens, Ohio, 76 miles, with capital stock of $1,500,000, but beyond making preliminary surveys and securing some rights of way, nothing was done towards the construction of the line. Milbury M. Greene (a) who was operating salt works at Salina (now Beaumont) Ohio, in the Hocking Valley, seven miles north of Athens, in 1867 took up the project and labored for some time in Southern Ohio to secure subscriptions to the capital stock, with little success. He then went to Columbus and presented the project to citizens for the development of the coal and iron fields of the valley. After a cool reception and much discouragement he finally interested a few of the monied citizens, including Peter Hayden (b), Benjamin E. Smith, Isaac Eberly and several others. June 26, 1867, by decree of the Franklin County Court, the name was changed from the Mineral Rail Road Company to *Columbus & Hocking Valley Railroad Company.* A history of the county, speaking of the newly formed railroad, has this to say: "It was literally born in Columbus. Its sponsors were a group of the keenest business men of the capital city who realized the vast importance of a more rapid and satisfactory connection with the rich bituminous coal fields of the Hocking Valley than the slow and cumbersome canal service afforded." Peter Hayden was elected president and Mr. Greene vice president. The road was finally located, construction begun and was opened for traffic from Columbus to Lancaster, 32 miles, and in May 1869 was completed as far as Nelsonville, 62 miles, where it reached the coal field. July 25, 1870, construction was finished to Athens with a thirteen mile branch from Logan to Straitsville in the coal district, the branch being opened January 2, 1871. The new line prospered from the start and the effect of an abundant supply of coal at less cost proved of the greatest value in the natural and manufacturing growth of Columbus.

The annual report for the year 1870 stated that the company owned nine locomotives, eight passenger coaches, three baggage, mail and express cars, 279 coal cars, 60 box cars and 26 flat cars, in addition to which private concerns furnished 403 coal cars, and that with all this equip-

ment, together with 150 other cars furnished by connecting lines, the company was unable to supply the demand for coal and would have to provide more equipment. The gross earnings of the line for 1870 amounted to $372,229. In that year the population of the city of Columbus was 33,000 and its subsequent substantial growth began with the building of manufacturing concerns immediately upon the introduction of coal by the railroad up the Hocking Valley.

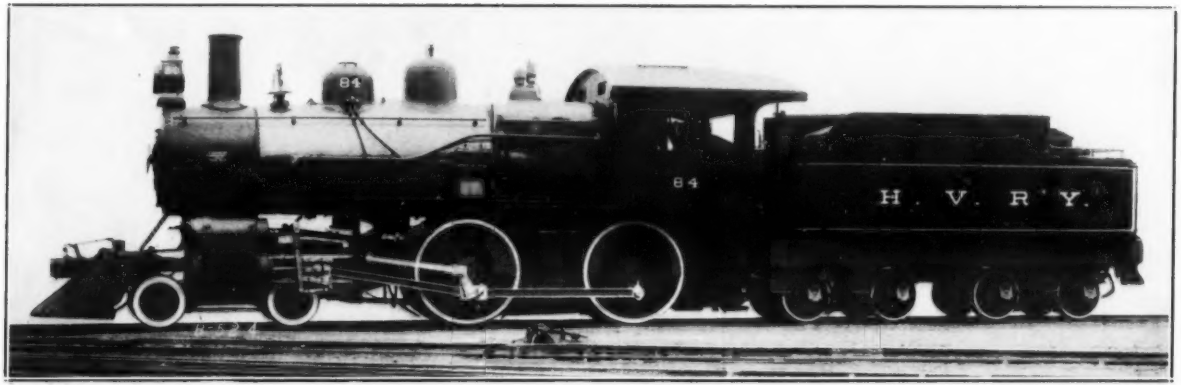
In the year 1871 the gross earnings increased to $548,942, and the report for that year stated that a valuable trade for coal had been commenced through Cleveland to points on Lake Erie. The report further stated that the heavy traffic made it necessary to renew some of the rails, and that, in order to have a test between iron and steel, fifty tons of steel rails had been purchased as an experiment and laid in sidings in the Columbus yard under the heaviest wear of any part of the road.

In January 1871 Benjamin E. Smith of Columbus succeeded Peter Hayden as president of the company, Mr. Greene remaining as vice president. The company now had twelve locomotives. After the opening of the road several branch lines owned by private companies and individuals had been constructed from the property of the Columbus & Hocking Valley to the coal and iron mines of the region traversed.

The coal business of the road developed rapidly, the gross earnings for the year 1872 being $854,892. The company trebled its number of coal cars and began to feel the need of proper outlets for traffic to points beyond Columbus, connecting lines being either unable or unwilling to furnish cars for the business offered their lines. It was thereupon determined to undertake the construction of a northern extension to supply the great demand of the lakes and the northwest for Hocking Valley coal, and Toledo was selected as the most appropriate port. Accordingly, on May 28, 1872, the *Columbus & Toledo Railroad Company* was incorporated by the interests controlling the Columbus & Hocking Valley, with Mr. Greene as president and Mr. Smith a director of the new corporation.

October 15, 1873, the new line was permanently located from Columbus to Toledo, 124 miles. The financial panic of 1874, however, made it necessary to defer for nearly a year the construction, which was not commenced until August 1875. October 15, 1876 the line from Columbus to Marion was opened for traffic, and on January 10, 1877, the first regular train ran through to Toledo, where the company had acquired valuable frontage on the Maumee River for the construction of docks. During the early years the company used the line of the Toledo & Woodville Railroad Company from Walbridge to Toledo, six miles.

February 22, 1877, the Columbus & Hocking Valley and the Columbus & Toledo railroad companies entered into a contract providing for the joint management and operation of the two railways and for the joint use of terminal properties and facilities in Columbus, but separate annual reports were rendered by the two companies. The Columbus & Toledo reported nine locomotives in 1878, eleven in 1879, twelve in 1880 and eighteen in 1881. Annual reports of the Columbus & Hocking Valley show sixteen locomotives in 1873, twenty-five in 1874, thirty-one in 1876, thirty-five in 1880 and forty in 1881.



—Courtesy of American Locomotive Co.

Hocking Valley 84. Brooks, 1907. 18x26" 66" 138000.

During the year 1877 extensive docks were constructed in Toledo and connecting lines in that city furnished an outlet to points in Michigan and Canada.

In the meantime the Columbus & Hocking Valley had continued to prosper. In December 1874, Mr. Greene succeeded Mr. Smith as president and in 1877 the Monday Creek branch, seven miles, and the Snow Fork branch, four miles, extending into the coal fields, were opened for traffic and seven iron furnaces were in blast in the coal region.

By this time the two companies had the same administrative and operating officials and Boards of Directors.

March 3, 1870, there had been organized by capitalists in the southern part of the state the *Gallipolis, McArthur & Columbus Railroad Company*, the charter granting authority to construct a steam railroad from Gallipolis on the Ohio River northerly to a connection with the Columbus & Hocking Valley at Logan, 65 miles. This was a section of inexhaustibly rich coal and iron deposits and a quality of stone almost equal to conglomerate marble. William H. Langley of Gallipolis was president of this company with principal office in that city. The name was changed June 27, 1876 to the *Columbus & Gallipolis Railroad Company*. The new charter entitled the company to construct from Gallipolis to Columbus, 115 miles. Charles C. Walcutt (c) of Columbus was named as president. Up to 1878 forty-five miles of right of way had been graded and three miles were in operation between Vinton and Vinton Furnace. Nothing further seems to have been accomplished and on May 22, 1878 the property was again reorganized as the *Ohio & West Virginia Railway Company*, with a new charter limiting the northern terminus to Logan in the Hocking Valley. James S. Brazee of Lancaster, an attorney, was elected president of the O. & W. V. The new company seems to have graded but six additional miles, and no progress was made until one year later, May 21, 1879, when the interests behind the C. & H. V. and the C. & T., took up the project, secured an amended charter granting the right to extend the line northeasterly from Gallipolis to Pomeroy, along the Ohio River, and commenced construction. October 15, 1880 the line was opened for traffic from Logan to Gallipolis, and on January 1, 1881, to Pomeroy, a total of 84 miles from Logan to Pomeroy. At Gallipolis and Pomeroy barges were loaded with coal and transported down the Ohio River to Cincinnati and southern points. For the year 1880 the Ohio & West Virginia reported owning eight locomotives. The principal office was moved from Gallipolis to Columbus when the Hocking Valley interests secured control and Mr. Greene was elected president in place of Mr. Brazee, with the same group of officers and directors as the Columbus & Hocking Valley and the Columbus & Toledo.

August 20, 1881, the Columbus & Hocking Valley, the Columbus & Toledo and the Ohio & West Virginia companies were consolidated under the name of the *Columbus, Hocking Valley & Toledo Railway Company*. The first annual report issued by the reorganized company shows its lines as follow:

Main, Toledo to Pomeroy	257 miles
Branch, Logan to Athens	27 miles
Branch, Logan to Straitsville	13 miles
Nelsonville to Murray City and Carbon Hill	17 miles
Snow Fork Junction through the Snow Fork Valley	5 miles
Sand Run Branch	3 miles
Brush Fork Branch	3 miles
Other short branches	2 miles
Total	327 miles

The report for the year 1882 shows 76 locomotives. The new company inherited 40 from the C. & H. V., 18 from the C. & T., and 8 from the O. & W. V., 66 in all. Apparently it purchased ten new engines in 1882.

Mr. Greene continued as president of the new company until July 1, 1886, when he was succeeded by Stevenson Burke* of Elyria, an attorney, always referred to as Judge Burke, having in his younger days been a justice in one of the lower courts. He occupied the presidency for a few months ending January 11, 1887, the next annual meeting, at which John W. Shaw of Columbus was elected president, he having purchased the holdings of Judge Burke, with a new Board of Directors. He continued in office until August 30, 1889, when he resigned and was succeeded by Christopher C. Waite (d).

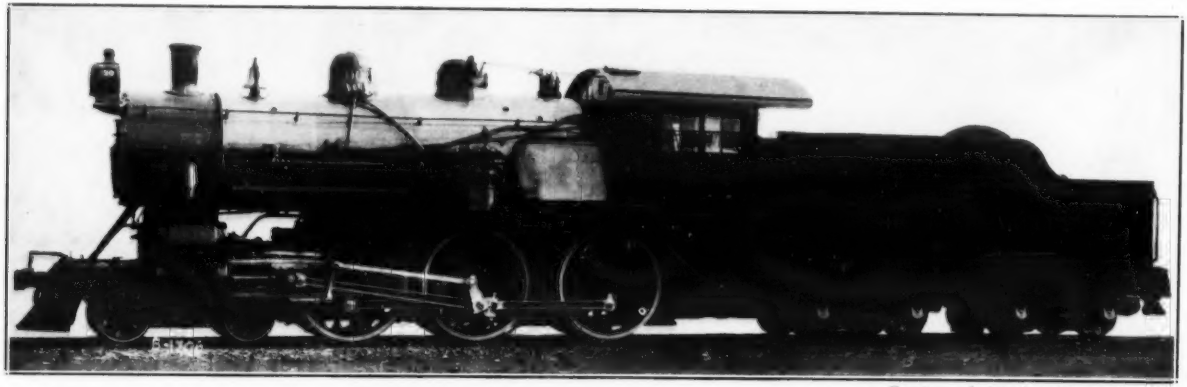
Mr. Waite came to the company with large railway experience and immediately set about the work of reducing grades, rebuilding bridges and introducing heavier equipment upon the line, increasing the capacity of coal trains from thirty cars of seventeen tons each to forty-five cars of thirty tons each, which brought the property up to the best standards of that day and it assumed its position as the principal coal-carrying road of the state.

In 1895, a branch line, the Wellston & Jackson Belt Railway (charter January 22, 1895) was built by the Hocking Valley people from McArthur Junction, near Dundas, to Jackson, 17½ miles, with spurs of two miles, the C. H. V. & T., owning all the capital stock and bonds. This subsidiary passed through the coal field of Jackson County, affording a valuable feeder to the main line, and was opened for traffic to Wellston December 1, 1895 and to Jackson February 10, 1896.

Of the five seams of bituminous coal mined in the state of Ohio, four were on the line of the Columbus, Hocking Valley & Toledo railway, and through its connections with the Kanawha & Michigan railroad at Athens it also received shipments of coal and coke from the Kanawha and New River districts of West Virginia, and transported coal for shipment by lake to the amount of two million tons yearly.

Although the carrying of bituminous coal and coke continued to be the principal business of the company, there had been a steady development along its line in manufacturing and particularly in steel and iron, stone, lime and clay products.

*After leaving the Hocking Valley he built the Toledo & Ohio Central, an opposition line.



Hocking Valley 90. Brooks, 1912. 21x26" 72" 188000.

—Courtesy of American Locomotive Co.

While attending a banquet given to the officials of the railway company by the citizens of Jackson on the occasion of the opening of the branch line, President Waite took cold, resulting in pneumonia, from which he died February 21, 1896. Samuel D. Davis of New York City, vice president, became the executive head of the company until June 18, 1896, when he was succeeded by Nicholas Monsarrat (e) of Columbus, as president.

The bonding of the company to an amount of seven million dollars during President Burke's administration, the improvements in the physical properties, purchases of new equipment, building the Wellston & Jackson Belt branch, etc., placed heavy financial burdens upon the company and it became embarrassed to such a degree that a receiver, Mr. Monsarrat, was appointed by the courts February 25, 1897. Interest having been defaulted on the March 1897 coupons, the trust company filed a suit of foreclosure. A newspaper article of the time stated: "During the sixteen years following the organization of the Columbus, Hocking Valley & Toledo the company prospered and suffered, as did many other lines in those days of unfavorable legislation, strikes and business depressions, so that the year 1897 found the property in charge of the Federal courts, but it is too valuable a property to linger there." The road continued in receivership two years.

February 25, 1899 the line was reorganized as *The Hocking Valley Railway Company* and took over the properties and securities of the Columbus, Hocking Valley & Toledo. Mr. Montsarrat was elected president of the new corporation and his annual report for 1899 shows 94 locomotives on the roster.

During Mr. Monsarrat's term of office radical improvements were made in the capacity of the line for handling traffic; eight thousand larger and heavier coal cars were added, mogul freight engines were superceded by consolidation engines of greater capacity, improved machinery for handling coal and iron ore were placed on the company's docks at Toledo, and the yards, sidings and station facilities of the railway were increased to take care of the growing traffic. During the ten years of his administration the freight business of the road doubled and the passenger traffic made almost as great a gain.

In March 1910 the Chesapeake & Ohio Railway purchased a majority of the capital stock of the Hocking Valley, and on the 22nd of that month five members of the Board of Directors of the latter company resigned and were succeeded by C. & O. men, among whom were Frank Trumbull and George W. Stevens, elected chairman and president, respectively. This resulted in many changes in administrative and operating officials. The road eventually came under the control of the Van Sweringen brothers in 1925. It has now entirely lost its individual identity, having been merged into the Chesapeake & Ohio.

References in this chapter are as follows:

(a) Milbury Miller Greene was born at Lewiston Falls, Maine, May 11, 1830 and was graduated from the Lewiston Falls Academy. With Walter H. French of New Hampshire, a railroad contractor, he went to Ohio in 1851 and endeavored to secure a construction contract. Failing

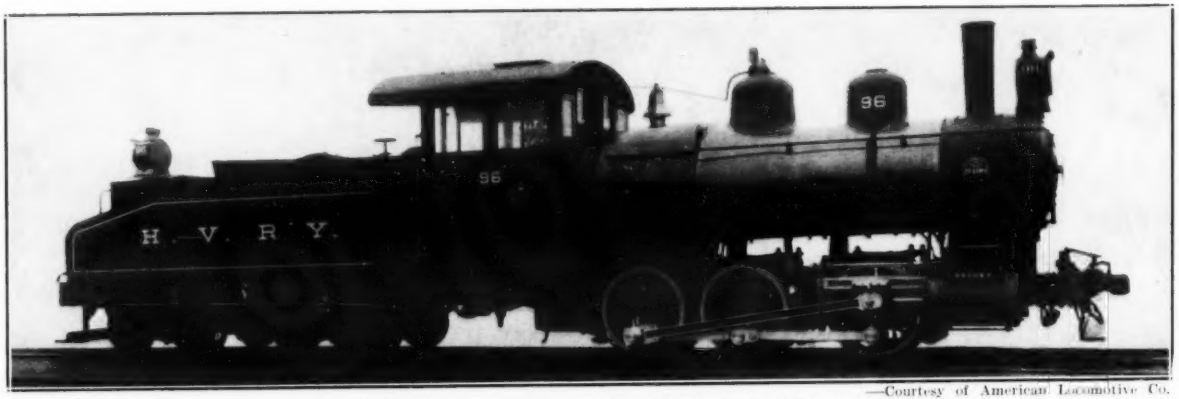
in this, Mr. Greene went to work as a paymaster for a firm of railroad contractors. After eleven months in this position he and Mr. French and several acquaintances from Vermont and New Hampshire formed a partnership and secured a contract for building a part of the Cincinnati & Marietta railroad. After completion of the contract Mr. Greene bought some salt works properties in southern Ohio. He devoted much of his time and private means to the preliminary surveys and in securing subscriptions for the railroad, with little or no encouragement. He went to Columbus a perfect stranger to awaken interest and solicit aid. His career as a railroad man was continuous from 1848 to June 30, 1886 when on account of ill health and the need of a rest he resigned the presidency of the Columbus, Hocking Valley & Toledo railway. He died June 26, 1887.

(b) Peter Hayden appears to have been a native of New York City. I have been unable to definitely verify this, but it is known that he maintained an office in the metropolis for many years. He had been a manufacturer and dealer in Columbus since 1834, commencing business under the name of the Columbus Iron Works. Later he conducted a saddlery hardware manufacturing company and was president of the banking house of P. Hayden and Company. He was the owner of extensive coal lands at Haydenville and in the year 1871 freight charges on his shipments of coal over the railroad amounted to $43,000. In the History of Columbus published in 1873 Mr. Hayden carried an advertisement in which he described himself as a miner of Hocking coal.

(c) Charles Carroll Walcutt was born in Columbus February 12, 1838. He was educated in the public schools of that city and the Kentucky Military Institute at Frankfort, from which he graduated June 1858 and was appointed County Surveyor of Franklin County, Ohio, in 1859. He entered the Union Army as a captain in 1861 and rose to the grade of Brigadier General July 22, 1864. Mustered out of military service February 6, 1866 and was appointed warden of the Ohio State Penitentiary at Columbus. Later he was U. S. Collector of Revenue for the Seventh District of Ohio.

(d) Christopher C. Waite was the son of Morrison R. Waite, Chief Justice of the United States Supreme Court and was educated in the engineering profession. The first notice we find of him in the railway world was in 1878 when he was superintendent of the Cincinnati & Muskingum Valley Railroad. In 1881 he was superintendent of the Little Miami railroad at Cincinnati, but soon went to New York City where he became an operating official of the Erie. Later he became vice president of the Cincinnati, Hamilton & Dayton railroad with offices at Cincinnati, where he remained until his election to the presidency of the Columbus, Hocking Valley & Toledo railway. His widow, nee Lillian Guthrie of Zanesville, Ohio, and two sons, Henry and Ellison, continued to make their home in Columbus after Mr. Waite's death.

(e) Nicholas Monsarrat was a French Canadian. Before going with the Hocking Valley he was president of the Columbus, Sandusky & Hocking Railway Company. After leaving the Hocking Valley he retired to his estate on the Olentangy River near Powell, a suburb of Columbus, where he remained until his death.



—Courtesy of American Locomotive Co.

Hocking Valley 96. Brooks. 1900. 19x26" 50" 113000.

Before closing this narrative I wish to pay tribute to a grand old gentleman who has taken a great interest in the history of the railway and who has been most helpful in its preparation. The height to which he climbed from a humble beginning to be General Freight and Passenger Agent of the Hocking Valley system is an achievement of which he, his children and grandchildren may well be proud. William Hyde Fisher was born in Elyria, Ohio, August 5, 1854, and is now, at this writing (the autumn of 1939) past eighty-five years of age. After finishing the grade schools he learned the printer's trade, but gave that up in 1880 to enter the general offices of the Indianapolis, Peru & Chicago railway at Indianapolis, Ind., with the title of Traveling Passenger Agent, his principal duties being to handle the company's publicity work. Two years later the road was absorbed by the Wabash and Mr. Fisher became city ticket agent at Indianapolis. A year or two later he took a place with the Indianapolis Journal, having charge of outside circulation, where he remained three years. He then accepted a position as general agent of the Cincinnati, Hamilton & Dayton railroad, where his work attracted the attention of George E. Saul, one of the officials, who, when he went to Fort Wayne in 1889 as general manager of the Fort Wayne, Cincinnati & Louisville railroad, invited Mr. Fisher to join him and appointed him general passenger agent.

Fate decreed that Mr. Fisher's stay in Fort Wayne should be short for, on May 1, 1890, the Lake Erie & Western took over the Fort Wayne, Cincinnati & Louisville, and he was out. A month later, however, he was made general passenger agent of the Columbus, Hocking Valley & Toledo, which position he filled until May 1, 1930 when, upon the C. & O. taking over the Hocking Valley, Mr. Fisher was retired on pension.

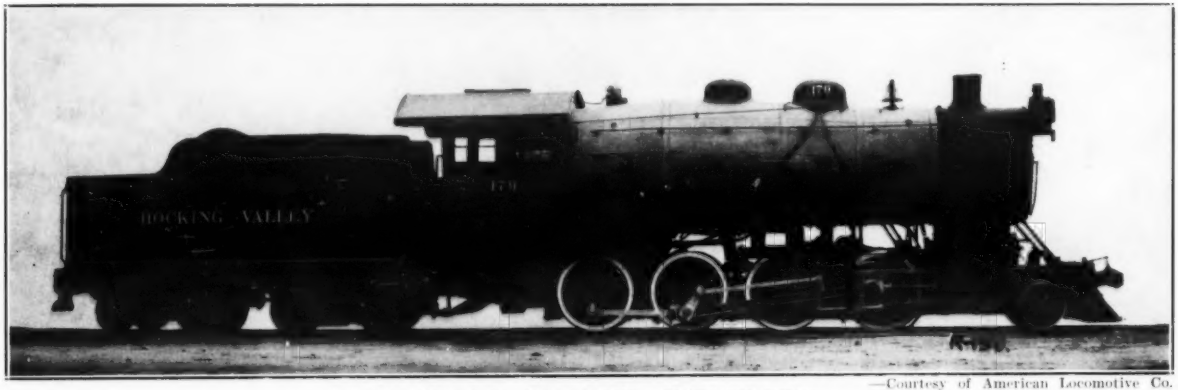
An enthusiastic worker in civic and community affairs Mr. Fisher was most active until advanced years made it advisable for him to lay down his tools. His hobby was agriculture and he maintained a beautiful farm at Powell. He organized and was president for many years of the Delaware County Agricultural Society at Delaware, Ohio. In Columbus he served as civil service commissioner, director of the Chamber of Commerce and chairman of the executive committee of Ohio railroads. For eleven years he was in command of the Columbus Rifles, an independent military company of national reputation and it was from this connection that he acquired the title of Captain, with which he is honored today.

Mr. Fisher now resides with his wife, a married daughter and several grandsons at The Homestead, Worthington, Ohio.

Captain Robinson, the author of this interesting sketch, has asked your Editor to prepare the roster of Hocking Valley R. R. locomotives. Both the American Locomotive Co. and the Baldwin Locomotive Works have been kind enough to furnish lists of locomotives from their records. Mr. D. S. Ellis, Chief Mechanical Officer of the Chesapeake & Ohio Ry. produced an inventory of locomotives which must have been made around 1904. In spite of this, but little is known of the locomotives purchased by the roads that made up the C. H. V. & T. At the time this road was formed—1881, the report for the year following states

the road owned 76 locomotives. Of this number, only 55 have been located. Furthermore, we know nothing of how these locomotives were renumbered into the C. H. V. & T. series. Of the locomotives of this road, we can present a fairly complete record. Evidence exists that the motive power of this road was pooled with that of the T. & O. C.; K & M and Z & W roads and that there was probably some swapping of power. Of this, we know but little. However, we hope our readers will take this roster for what it is worth and if any of them can shed any additional light on the subject, we will be only too glad to have this data.

	1	Unknown		1868	4-4-0	15x22"	60"	56500	C&HV	#1
	1	Pittsburgh	1328	1892	2-6-0	19x24"	54"	111500	CHV&T	#1
	2	Rogers	.....	1878	4-4-0	C&T#2	Doubt. if		CHV&T	#2
	2	Pittsburgh	1329	1892	2-6-0	19x24"	54"	111500	CHV&T	#2
3-	6	Unknown								
	3	Pittsburgh	1372	1892	2-6-0	19x24"	54"	111500	CHV&T	#3
	4	Baldwin	11593	1891	2-6-0	19x26"	54"	104390	CHV&T	#4
	5	Pittsburgh	1330	1892	2-6-0	19x24"	54"	111500	CHV&T	#5
	6	Baldwin	11829	1891	0-6-0	19x24"	50"	98000	CHV&T	#6
	7	Rogers	.....	1869	4-4-0	16x22"	54"	.....	C&HV	#7
	7	Pittsburgh	1371	1892	0-6-0	19x24"	50"	103450	CHV&T	#7
	8	Rogers	.....	1869	4-4-0	16x22"	54"	.....	C&HV	#8
	8	Pittsburgh	1445	1893	0-6-0	19x24"	50"	103450	CHV&T	#8
	9	Rogers	.....	1869	4-4-0	16x22"	54"	.....	C&HV	#9
	9	Pittsburgh	1491	1893	0-6-0	19x24"	50"	103450	CHV&T	#9
10-	25	Unknown								
10-	11	Pittsburgh	.....	1892	0-6-0	19x24"	50"	101000	CHV&T	#10-11
	12	Pittsburgh	1373	1892	2-6-0	19x24"	54"	111500	CHV&T	#12
	13	Pittsburgh	1451	1893	2-6-0	19&29x26"	54"	116200	CHV&T	#13
	14	Pittsburgh	1489	1893	2-6-0	19&29x26"	54"	116200	CHV&T	#14
	15	Pittsburgh	1490	1893	2-6-0	19&29x26"	54"	116200	CHV&T	#15
	16	Pittsburgh	1332	1892	2-6-0	19x24"	54"	111500	CHV&T	#16
	17	Pittsburgh	1331	1892	2-6-0	19x24"	54"	111500	CHV&T	#17
	18	Baldwin	11598	1891	2-6-0	19x26"	54"	104390	CHV&T	#18
	19	Pittsburgh	1374	1892	2-6-0	19x24"	54"	111500	CHV&T	#19
20-	21	Pittsburgh	.....	1892	2-6-0	19x24"	54"	111500	CHV&T	#20-21
	22	Baldwin	11600	1891	2-6-0	19x26"	54"	104390	CHV&T	#22
23-	24	Baldwin	.....	1891	2-6-0	19x26"	54"	104390	CHV&T	#23-24
	25	Pittsburgh	1375	1892	2-6-0	19x24"	54"	111500	CHV&T	#25
	26	Rogers	2336	1873	0-4-0	16x22"	50"	.....	C&HV	#26
	26	Pittsburgh	.....	1892	2-6-0	19x24"	54"	111500	CHV&T	#26
	27	Rogers	2325	1873	4-4-0	16x24"	61"	.....	C&HV	#27
	27	Pittsburgh	.....	1892	2-6-0	19x24"	54"	111500	CHV&T	#27
28-	29	Unknown								
	30	Rogers	2376	1874	4-4-0	16x24"	61"	.....	C&HV	#30
	31	Rogers	2384	1874	0-4-0	16x22"	50"	.....	C&HV	#31
	32	Rogers	2516	1879	0-4-0	16x22"	50"	.....	C&HV	#32
	33	Rogers	2520	1879	4-4-0	16x22"	57"	.....	C&HV	#33
	34	Rogers	2539	1879	4-4-0	16x22"	57"	.....	C&HV	#34
	35	Rogers	2542	1879	4-4-0	16x22"	57"	.....	C&HV	#35
	36	Rogers	2608	1880	4-4-0	16x22"	57"	.....	C&HV	#36
	37	Rogers	2609	1880	4-4-0	16x22"	57"	.....	C&HV	#37
	38	Rogers	2631	1880	4-4-0	16x22"	57"	.....	C&HV	#38
	39	Rogers	2632	1880	4-4-0	16x22"	57"	.....	C&HV	#39
	40	Rogers	2640	1880	0-4-0	16x22"	40"	.....	C&HV	#40
	41	Rogers		1878	4-4-0	C&T #41	possibly		C&HV	#41
	41	Baldwin	11599	1891	2-6-0	19x26"	54"	104390	CHV&T	#41
42-	46	Unknown								
	47	Rogers	2452	1877	4-4-0	15x22"	61"	.....	C&T	#47



—Courtesy of American Locomotive Co.

Hocking Valley 179. Richmond 1911. 23x30" 57" 238000.

48	Rogers	2453	1877	4-4-0	15x22"	61"	..... C&T	#48
49- 51	Unknown							
52	Rogers	2518	1879	4-4-0	16x24"	62"	..... C&T	#52
53- 56	Hinkley	.....	1880	4-4-0	16x24"	64"	76000 C&T	#53-56
57- 58	Brooks	477-478	1880	4-4-0	16x22"	58"	76000 C&T	#57-58
59- 60	Brooks	.....	1881	4-4-0	16x22"	64"	76000 C&T	#59-60
61- 62	Rogers	2959-60	1882	4-4-0	17x24"	58"	76000 CHV&T	#61-62
63- 64	Rogers	2996-97	1882	4-4-0	17x24"	58"	76000 C&T	#63-64
65	Rogers	2999	1882	4-4-0	17x24"	58"	76000 CHV&T	#65
66	Rogers	3004	1882	4-4-0	17x24"	58"	76000 CHV&T	#66
67- 68	Rogers	3025-26	1882	4-4-0	17x24"	58"	76000 CHV&T	#67-68
69	Rogers	3067	1882	4-4-0	17x24"	58"	76000 CHV&T	#69
70	Rogers	3069	1882	4-4-0	17x24"	58"	76000 CHV&T	#70
71- 73	Brooks	379-381	1879	4-4-0	16x22"	58"	..... O&WVa	#71-73
71- 73	Brooks	3487-89	1900	4-4-0	18x26"	72"	124000	
74- 76	Brooks	410-412	1880	4-4-0	16x22"	58"	..... O&WVa	#74-76
74- 76	Brooks	3490-92	1900	4-4-0	18x26"	72"	124000	
77- 78	Brooks	445-446	1880	4-4-0	16x22"	58"	..... O&WVa	#77-78
77- 78	Brooks	549-550	1881	4-4-0	16x22"	64"	..... C&HV	#77-78
		One of the above groups must have been renumbered or sold.						
77- 78	Brooks	29501-02	1904	4-4-0	18x26"	66"	133000	
79	Rogers	2962	1882	0-4-0	16x22"	50"	58500 CHV&T	#79
80	Rogers	2966	1882	0-4-0	16x22"	50"	58500 CHV&T	#80
81- 82	Rogers	3013-14	1882	0-4-0	16x22"	50"	58500 CHV&T	#81-82
79- 80	Brooks	29503-04	1904	4-4-0	18x26"	66"	133000	
81- 82	Brooks	38656-57	1905	4-4-0	18x26"	66"	131500	
83- 86	Brooks	.....	1881	0-4-0	16x22"	50"	58500	
87- 90	Brooks	.....	1881	4-4-0	16x22"	58"	68400	
83	Brooks	38658	1905	4-4-0	18x26"	66"	131500	
84- 85	Brooks	43691-92	1907	4-4-0	18x26"	66"	138000	
86- 88	Brooks	48291-93	1910	4-6-0	20x26"	72"	188000	
89- 90	Brooks	57732-33	1912	4-6-0	21x26"	72"	188000	
91- 95	Rhode Is.	2401-05	1890	2-6-0	19x24"	54"	110000 CHV&T	#91-95
		Sold—T&OC 352-356						
93- 94	Baldwin	11879-80	1891	2-6-0	19x26"	54"	104390 CHV&T	#93-94
96- 98	Rhode Is.	2607-09	1891	2-6-0	19x24"	54"	110000 CHV&T	#96-98
99-100	Unknown							
91- 92	Richmond	54304-05	1913	4-6-0	21x26"	72"	190000	
96- 97	Brooks	3498-99	1900	0-6-0	19x26"	50"	113000	
98-100	Brooks	3515-17	1900	0-6-0	19x26"	50"	113000	
101-102	Brooks	571-572	1881	0-4-2T	16x22"	50"	..... C&HV	#101-102
103-104	Brooks	589-590	1881	0-4-0	16x22"	50"	..... C&HV	#103-104
		Probably were renumbered H V 83-86						
105-108	Rogers	2751-54	1881	4-4-0	16x22"	58"	..... C&HV	#105-108
		Probably were renumbered H V 87-90						
101-102	Baldwin	11405-06	1890	2-6-0	19x26"	54"	104390 CHV&T	#101-102
		Probably sold to T&OC Nos. 350-351						
106-107	Pittsburgh	1282-83	1892	0-6-0	19x24"	50"	103450 CHV&T	#106-107
		Probably sold to T&OC Nos. 365-366						
108-110	Pittsburgh	1284-86	1892	2-6-0	19x24"	54"	111125 CHV&T	#108-110
		Sold						
101-105	Brooks	3906-10	1901	0-6-0	20x26"	50"	112000	
106-110	Brooks	26248-52	1902	0-6-0	19x26"	50"	114000	
111-115	Brooks	27221-24	1903	0-6-0	19x26"	50"	116000	
116-121	Brooks	38659-64	1903	0-6-0	20x26"	50"	129000	
122-124	Brooks	41149-51	1906	0-6-0	20x26"	50"	130000	
125-129	Brooks	43693-97	1907	0-6-0	20x26"	50"	130000	
130-131	Baldwin	52448-49	1919	2-10-2	29x32"	69"	374100 LV	#4060-61
132-133	Baldwin	52491-92	1919	2-10-2	29x32"	69"	347100 LV	#4062-63
134-135	Baldwin	52577-78	1919	2-10-2	29x32"	69"	347100 LV	#4064-65
136	Baldwin	52631	1919	2-10-2	29x32"	69"	347100 LV	#4066
137	Baldwin	52668	1919	2-10-2	29x32"	69"	347100 LV	#4067
138-143	Baldwin	52670-75	1919	2-10-2	29x32"	69"	347100 LV	#4068-73

144-145	Baldwin	52705-06	1919	2-10-2	29x32" 69"	347100 LV #4074-75

HV 140-144 were sold to the Lake Superior & Ishpeming R. R. and 145 was sold to the Woodward Iron Co.

150-159	Brooks	48154-63	1910	2-8-0	23x30" 57"	235000
160-169	Brooks	48281-90	1910	2-8-0	23x30" 57"	236500
170-179	Richmond	49909-18	1911	2-8-0	23x30" 57"	238000
180-184	Richmond	51734-38	1912	2-8-2	29x28" 56"	322500
185-190	Richmond	54298-03	1913	2-8-2	29x28" 56"	322500
200-209	Pittsburgh	1983-84	1899	2-8-0	20x26" 54"	139750
210-214	Baldwin	17295-99	1899	2-8-0	20x26" 54"	140000
215-216	Baldwin	17976-77	1899	2-8-0	20x26" 54"	140000
217-218	Baldwin	17979-80	1899	2-8-0	20x26" 54"	140000
219-220	Baldwin	17997-98	1899	2-8-0	20x26" 54"	140000
221-222	Baldwin	18006-07	1899	2-8-0	20x26" 54"	140000
223-224	Baldwin	18063-64	1899	2-8-0	20x26" 54"	140000
225-232	Brooks	3679-86	1900	2-8-0	20x26" 54"	140000
233-237	Brooks	3937-41	1901	2-8-0	20x26" 54"	152000
238-239	Baldwin	20164-65	1902	2-8-0	20x26" 54"	145500
240-242	Baldwin	20189-91	1902	2-8-0	20x26" 54"	145500
243-245	Baldwin	21177-79	1902	2-8-0	20x26" 54"	145500
246-247	Baldwin	21193-94	1902	2-8-0	20x26" 54"	145500
248-257	Brooks	26809-18	1902	2-8-0	20x26" 54"	155000
258-267	Rogers	5957-66	1903	2-8-0	20x26" 54"	150000
268-277	Brooks	43676-85	1907	2-8-0	20x26" 54"	162000

205-224	Richmond	60210-29	1919	2-6-6-2	22&35x32" 57"	437000
225-239	Schenect.	68452-66	1930	0-8-0	25x28" 52"	236000
280-281	Baldwin	27066-67	1906	2-8-0	22x28" 50"	192000
282	Baldwin	29578	1907	2-8-0	22x28" 50"	192000

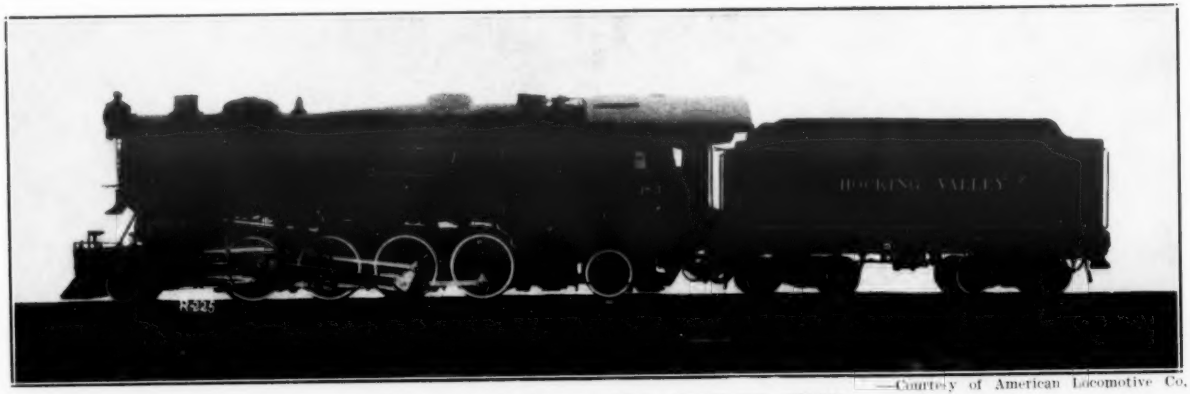
HV 280-282 were originally built for the Cumberland & Pennsylvania R. R. Nos. 27-29, renumbered 37-39. The C & P sold these engines in 1917 to the Walter A. Zelnicker Supply Co.

337-347	Brooks	41134-43	1906	2-8-0	20x26" 54"	156000

In presenting this roster, the road ordering the engine together with the road number is indicated at the extreme right. Where this is omitted, the locomotive was ordered by the Hocking Valley as this roster is arranged according to their series of numbers.

Mr. Ellis advises that at the time the C & O took over the Hocking Valley in 1925, the following locomotives were taken over by that road:

81	P-5	4-4-0	Brooks	1905	18x26" 66"	135200
84- 85	P-1	4-4-0	Brooks	1907	18x26" 66"	141400
86- 87	T-1	4-6-0	Brooks	1910	21x26" 72"	195000
88	T-1	4-6-0	Brooks	1910	18x26" 66"	135200
89- 90	T-2	4-6-0	Brooks	1912	21x26" 72"	188000
91- 92	T-2	4-6-0	Richmond	1913		
100-109	S-9	0-8-0	Lima	1926	25x28" 51"	221000
119	S-7	0-6-0	Brooks	1906	20x26" 50"	133450
122-124	S-7	0-6-0	Brooks	1906		
125-129	S-8	0-6-0	Brooks	1907	20x26" 50"	131750
130-145	F-1	2-10-2	Baldwin	1919	29x32" 69"	374100
150-159	C-10	2-8-0	Brooks	1910	23x30" 57"	241000
160-169	C-11	2-8-0	Brooks	1910	23x30" 57"	244000
170-179	C-12	2-8-0	Richmond	1911	23x30" 57"	244000
180-184	M-1	2-8-2	Richmond	1912	29x28" 56"	322500
185-190	M-1	2-8-2	Richmond	1913		
200-204	A-1	2-6-6-2	Schenectady	1917	22&35x32" 57"	435000
205-224	A-1	2-6-6-2	Schenectady	1918		
268-270	C-9	2-8-0	Brooks	1907	20x26" 54"	164000
275-276	C-9	2-8-0	Brooks	1907		
280-282	C-13	2-8-0	Baldwin	1906-07	22x30" 56"	204000



—Courtesy of American Locomotive Co.

Hocking Valley 183. Richmond. 1912. 29x28" 56" 322500

Bringing the Rails to Boise

A Chapter in Western Development

By Randall V. Mills

By 1882 Boise City, Idaho, was a staid and reasonably respectable city with three thousand inhabitants. As cities went in the West, Boise had attained in her twenty years of life a sober middle age.[1] The town had its beginnings when a group of enterprising civilians settled a mile from the new site of Fort Boise in the early Sixties and proceeded to do what so commonly was done in such situations—survey a townsite. Then the promoters issued a gaudy lithographed map of the proposed metropolis, began to sell lots, and started a campaign to have the capital of the Territory moved to the straggling town.[2] The Legislature obligingly heeded the cry from the wilderness, moved down to the hamlet of two hundred people and gave Boise a more certain start on its career. But the place grew slowly. Though it was the center of a good trading area, with the mines of Idaho City to the north and of the Owyhee to the south, and with fine cattle grazing in the hills, and thriving orchards beginning to appear in the valley and on the bench, by 1880 Boise still lagged, because it suffered under a handicap of location—it had no direct connection with the rest of the world.

Boise might have been on the Oregon Trail,[3] but a newer, faster route to the coast superseded it. The Snake was not navigable above Lewiston, and all of Boise's commerce and travel had to be carried on the long trip across dusty alkalai barrens in pitching Concords or heavy freight wagons dragged slowly along by patient mules. Stage lines radiated out of the town to the nearest railroad and steamboat connections: with the Central Pacific at Kelton, Utah, and the Columbia River steamers at Umatilla Landing.[4] The Central Pacific was far to the south; the Northern Pacific had stopped at Billings, Montana.[5] No railroad came to Boise, and Boise felt slighted.

Not that Boise had been overlooked. In 1866 a branch surveyed from the Union Pacific and known as the Idaho, Salt Lake and Columbia River Railroad Company[6] roused hopes; and in 1868 an Oregon plan, the Portland, Dalles and Salt Lake Railroad, would have tapped the Boise country,[7] but nothing came of either project. The Union Pacific made only empty gestures. So things rested until sometime after 1874; then Henry Villard arrived in Oregon. By 1879, when Villard

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[1] Bancroft, Hubert Howe, *History of Washington, Idaho and Montana* (San Francisco, 1890), p. 550, note 12.

[2] Hawley, J. H., *History of Idaho* (Chicago, 1920, 3 vols.), Vol. I, p. 695; Bancroft, *History of Washington, Idaho and Montana*, p. 541.

[3] Ghent, W. J., *The Road to Oregon* (New York, 1929), p. 146-148 passim.

[4] Strahorn, Carrie Adele, *Twenty Thousand Miles by Stage* (New York, 1911), p. 297.

[5] Hedges, James Blaine, *Henry Villard and the Railways of the Northwest* (New Haven, 1930), p. 97.

[6] Bancroft, *History of Washington, Idaho and Montana*, p. 554, note 23.

[7] Gaston, Joseph, *The Centennial History of Oregon* (Chicago, 1912, 4 vols.), Vol. I, p. 530.

had become a dominating figure in the Northwest, the time came. Villard had chartered the Oregon Railroad and Navigation Company, a consolidation of the Oregon Steamship Company, the Oregon Steam Navigation Company, various short portage railroads at the Cascades and at the Dalles, and the short line between Walla Walla and Wallula.[8] Quickly Villard organized his forces and began building a network of lines in eastern Oregon and Washington, and in 1881 started laying his proposed link east. Slowly the extension crept across the Blue Mountains to Pendleton, and to Baker.

Villard's activity aroused the Union Pacific, and it organized in 1881 the Oregon Short Line to answer the threat.[9] This road was planned to extend from the main line of the Union Pacific at Granger Wyoming, to a junction with the OR&N at the State line between Oregon and Idaho. Boise heard the news with glee; everyone felt certain that the road would follow the Snake River to Mountain Home, then veer north to Boise, and continue down the Boise River to the Snake again, missing the rough and unsettled region north of the Owyhee and picking up the center of population.

In advance of the graders came dapper young Robert Strahorn, a pioneer of a special kind. Strahorn had written the first publicity for the Yellowstone region; he had done the intriguing descriptions of the wonders of the Colorado Rockies; he had, in short, been a splendid advertising agent for the Union Pacific. Now, however, he seemed to be completely on his own business. His business was real estate, and he worked quietly. In the meantime the railway was slowly moving to the west from Granger.

First Strahorn paused at a likely spot on the new grade and had a town laid out. The track followed the grade and paused at the townsite, named Shoshone. Lots sold like hotcakes, for it was rumored that the division shops of the short line would be located there. Boise real estate men, impatient to share the spoils, moved in and jumped some lots. The railroad blandly called off the laborers working on the shops, and the shops faded away while the track crept west.[10]

Mr. Strahorn packed his traps and moved to comfortable quarters at the Overland Hotel at Boise. Just about then Boise made an unpleasant discovery. A new survey carried the road along Indian Creek, instead of the Boise River, twenty miles to the south. Boise would be left to one side, and Boise knew the fate of towns in the west passed up by railroads. Mr. Strahorn smiled and said nothing, although the indignation of Boise's citizenry stopped short only of lynching.[11] Mr. Strahorn still smiled pleasantly and said nothing, having some irons in the fire which he was not yet ready to pull out. He was a promoter, a man of vast intentions; he would help settle Idaho.

Strahorn's interest in settling Idaho in the wake of the railroad was not purely impersonal. With Senator Caldwell of Kansas, he had formed the Idaho Oregon Land Improvement Company to establish and

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[8] Poor, Henry, *Manual of the Railroads of the United States for 1885*, p. 884.
[9] Trottman, Nelson, *History of the Union Pacific* (New York, 1923), p. 181.
[10] Strahorn, *Twenty Thousand Miles by Stage*, Chap. 33 passim.
[11] *Ibid.*, p. 496.

develop townsites along the railroad. Boise watched Strahorn's actions with interest; what he did would influence the future of the capital city. One spring morning Strahorn and his charming wife took a carriage and drove ostentatiously out of Boise, a large hamper with them, and headed north to the pleasant picnic spots along the river. But once out of sight of town, they circle back and rode through the dust of the place called Alkali Flat, where the railroad grade crossed the Boise River. There Strahorn got out, took a hatchet, and drove a stake. A new town was born, to be known as Caldwell.[12]

When Strahorn returned from his jaunt down the river and it became known that he planned to establish a townsite west of Boise, a roar went up that shook the pines of Coeur d'Alene. If a rival town grew up below, Boise might very well languish and die while the interloper thrived and flourished. Even the capital might move on, for Boise knew by experience how peripatetic Territorial capitals were in the west. Moreover, why should a stranger, an outsider, a greenhorn like Strahorn come in and take all the profits? Boise's speculators, an army with banners, sallied forth, scouted out the new townsite and began to buy ranches in its vicinity. Strahorn had carelessly dropped a hint, overheard by the anxious, that the town would be on the north side of the river, and a desperate scramble for land there followed. One over-anxious speculator even bought a ranch there at a fancy price from Strahorn. When Boise's men had paid two or three times what the alkali barrens north of the river were worth, Strahorn put a crew to work and laid out the town a mile away on the south side.[13]

Caldwell was a ready-planned town, as were so many along western railroads. A plat showing the location of every prospective street, lot, tree—for usually there were no trees already there,—school house, business block, depot, siding, court house, college, irrigation ditch, was prepared and blueprinted in advance, long before the site for the town had been selected.[14] Once the ground on which the town would be located had been decided upon, surveyors took the map, ran lines and drove stakes accordingly, and transferred as far as they were able the map to the country. Fortunately, Caldwell was on the level land of the Flat; unlike other towns that became cities, no hills, streams, or other unforeseen configurations of the landscape got in the way of the perfect design of the map.

The plan of Caldwell was a geometrical result of practicality. The streets formed a gridiron, the blocks of equal size and square, and the axis of the plan running from northwest to southeast. This last was no catering to the comfort of the potential Caldwellians in any attempt to coax the weak prevailing breezes, but was again the result of efficiency. The railroad happened to run through Caldwell in that direction; if the track cut through one single tier of blocks, and did not slice diagonally across many at irregular angles, more evenly shaped lots would be available for sale. Finally, with a magnificent show of poetic imagin-

[12] *Ibid.*, pp. 494-496.
[13] *Ibid.*, p. 493.
[14] French, Hiram T., *History of Idaho* (Chicago and New York, 1920, 3 vols.), Vol. I, p. 267.

ation, the street nearest the railroad and passing the depot was named Front, and the one paralleling it a block away, Main. Cross streets received sedate numbers, beginning at one extreme limit of the survey, so that the principal street crossing in the center of town by the depot bore a number impressively high in the 'teens.

The location of Caldwell was not spectacularly attractive. In the south, near the Snake River, Pickles or Squaw Butte reared above the plain; in the north a broken line of low hills divided the valley of the Boise from the valley of the Payette. Through the middle of the flat meandered the Boise, and across the plain the railroad grade marked a yellow scar. The flat itself was dry and dusty, supporting a sparse crop of sage brush. Near the crossing of the river by the railroad grade a few pine stakes among the brush marked Caldwell. To alleviate this desolation the Land Company planted two thousand spindly trees and cut an irrigation ditch from the river.[15] The soil, despite its discouraging appearance, was deep and rich, and needed only the water and good society to make it a promised land. On the richness of the soil would Caldwell depend, although Strahorn permitted the rumor to spread that Caldwell would have the division shops of the Short Line.

So Caldwell grew slowly. The Short Line's tracks reached the townsite, crossed the river and headed north. In the meantime the O. R. & N. was at work east of Baker, on the line to Idaho. During 1883 the only tangible evidence of Caldwell, except for the survey stakes, the young trees, and the irrigation ditch was a pile of uncured lumber stacked by the railroad track. Then in the summer a hot, dry wind came up, and the lumber submitted with a struggle, the boards shriveling and curling in the heat. "It was well known," wrote Mrs. Strahorn with delightful mock solemnity, "that an ex-cowboy was kept busy herding the twisting and wriggling boards inside the limits of Alkali Flat."[16] Once the energetic lumber had been replaced by sedater stuff, a few houses rose out of the brush. Theodore Danielson, who kept a store at Blackfoot with wide doors at both ends so that the cowboys could ride straight through and not knock over the stock, was the first to arrive with the intention of opening a general store. But regular service had not been established as yet on the Short Line, and Danielson, after looking over the town, had grave doubts that Caldwell would ever achieve the dignity of a whistling post. So he hesitated, refusing to build until Strahorn could give him definite assurance that the railroad would put in a siding. Strahorn promised, and as he did a train arrived with a crew and the iron for the job. It was a coincidence, but Strahorn's stock was wonderfully boosted.[17]

Before Danielson finished his building, quickly to Caldwell came Montie B. Gwinn, of Boise, to open a general merchandise store in a tent; the Fahys followed with a saloon; and then in rapid succession a hardware store, a pharmacy and a bank opened for business.[18] The railroad put up a depot building. After the first scanty year, people

[15] Boise (Idaho) *Weekly Statesman*, December 18, 1886.
[16] Strahorn, *Twenty Thousand Miles by Stage*, p. 522.
[17] *Ibid.*, p. 494.
[18] French, *History of Idaho*, Vol. I, p. 267.

began to flock into the new town, and Caldwell started to thrive. A newspaper, the *Tribune*, appeared. Frank Steunenberg and his brother opened a meat market.[19]

During 1884 Caldwell, after its long wait, saw the arrival of the first regularly scheduled through train. People flocked down from Boise and in from the scattered ranches to witness the spectacle. At last the train arrived, a nondescript collection of grayish, open-platform coaches, and stubby red box-cars, loaded to the sills with passengers. The locomotive, spurting plumes of steam, clanked into the station; all the horses lined by the hitching racks snorted unanimously in terror and went home, leaving their drivers afoot but enthusiastic.[20]

After the road was opened to traffic, a mixed train went into service between Caldwell and Pocatello. It was not a fast train. Sometimes it took fourteen hours to negotiate the hundred and sixty odd miles between Caldwell and Shoshone, although ordinarily it rushed along at a breathless fifteen miles an hour.[21] Shortly after, however, the Short Line met the OR&N at Huntington, Oregon, and then established a through daily passenger train, added Pullman sleepers, and improved service considerably.[22] In addition to the regular Pullmans, the Short Line operated its own Emigrant Sleepers, uncomfortable cars without many conveniences, to carry the great crowds of land seekers from the Middle West and Europe to utopian Idaho and Oregon. These coaches were substantial and well made—"out of the hardest kind of wood, particularly the seats," as one traveler observed.[23]

Business of the Short Line exceeded expectations, and the road found itself without enough equipment to handle the rush; its hurried orders for additional motive power were filled with exasperating slowness.[24] In 1885 the Oregon Short Line owned thirty-five locomotives, eight passenger coaches, and seven hundred and eighty-eight freight cars, and operated six hundred and nine miles of track, including its Wood River branch, extending north from Shoshone to another town laid out by Strahorn, Hailey.[25] Freight service, as the consequence of the shortage of equipment and the rush, was particularly bad. In spite of the strict company rule forbidding dead-head cars to remain on sidings more than a day, the road never could supply box-cars to shippers promptly. The two hundred and fifty coal cars owned by the Short Line were entirely inadequate to move the necessary tonnage of coal. As a result, each winter for a number of years after the opening of the road, a coal famine ensued along the line, and the shivering patrons tried to keep warm by cursing the company through blue lips and by

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[19] Strahorn, *Twenty Thousand Miles by Stage*, p. 504.

[20] *Ibid.*, p. 502.

[21] *Ibid.*, p. 515. In 1940 the Pacific Limited of the Union Pacific, according to the public timetable, makes the run between the two points, but *via* Boise (twelve miles shorter) in four hours and thirty minutes; the Portland Rose covers the distance in four hours and five minutes, and the City of Portland, a streamliner, schedules no stop in either town.

[22] *Ibid.*, p. 516.

[23] Boise *Weekly Statesman*, June 12, 1886.

[24] Caldwell (Idaho) *Tribune*, October 18, 1890.

[25] Poor. *Manual of the Railroads of the United States for 1885*, p. 855.

writing indignant letters to the newspapers. In 1890 the Caldwell *Tribune* was moved to say in editorial desperation:[26]

> The *Tribune* believes all property sacred, but it holds it not only the right, but a man's duty to steal coal from the railroad company, when they will not furnish it when he is willing to pay for it.

So the winters passed, with the company trying to move coal, and the settlers along the line freezing and swearing.

Caldwell became an eating station on the line before the operation of diners was started. At Caldwell, therefore, the trains stopped. Passengers from Boise, however, did not like the long trip down to Caldwell and used, instead, Kuna station, nineteen miles east of Caldwell, and fifteen miles south of Boise. Between Boise City and Kuna service was furnished by four-horse Concord coaches of the California, Oregon and Idaho Stage Company. The trip to Kuna was reasonably comfortable, although in rainy weather it sometimes required four hours. In Boise the arrival and departure of the stage drew a regular crowd of curious idlers, drawn by the romance of a passing institution. The stage was Boise's embarrassing link with the good old days.[27]

In the meantime Boise had not given up hope for a railroad, for the town came even more to realize that a railway was necessary for any sound and steady development of the city. Although Boise was growing, in spite of the rival Caldwell. In 1886 a Boise drug store advertised telephone service for deliveries; an electric light plant was projected, and the streets were filled with erratic riders of bicycles. The local papers that year protested that the custom of driving horse herds through the streets was not compatible with the dignity of the capital. Formal New Year's calls were the fashionable rage.[28]

When the Short Line passed by her on the other side, Boise turned to the second best plan: the construction of a branch from the main line. In 1884 Boise raised $60,000 and offered it to the Short Line as an inducement to build a branch north from Kuna, but the company refused, maintaining that any branch built would have to run up the valley from Caldwell, and pointing out the range of hills between Five Mile Creek and Boise would make too steep a grade for the railroad to surmount.[29] This was bitter, as it meant Boise would be continually subservient to the dictates of its upstart rival. Nothing else was to be done, though, and Boise sadly went about securing a right-of-way for the valley branch. A crew started grading the line, but when the grade had progressed only a few miles, without explanation the company called off the work and suavely pocketed the money.[30]

Soon came new rumors and new hopes. The Chicago and Northwestern was pushing west and was believed to be planning to make Boise its terminal.[31] On the coast, too, the Oregon Pacific had built its line

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[26] Caldwell *Tribune*, October 11, 1890.
[27] Boise *Weekly Statesman*, May 1, 1886.
[28] *Cf.* Boise *Weekly Statesman* and Boise *Republican* for the year 1886, *passim*.
[29] Strahorn, *Twenty Thousand Miles by Stage*, p. 505.
[30] *Boise Weekly Statesman*, August 21, 1886.
[31] *Ibid.*, March 6, 1886.

from Yaquina Bay through Corvallis and Albany, and was pushing up the Santiam River toward the Cascades. From there it planned to stretch across Oregon and reach Boise by a fork along the right bank of the Boise River.[32] To head off the threat of a new transcontinental railroad the Oregon Short Line began a grade west of Ontario, Oregon, along the Malheur, and surveyed a line from Caldwell through Boise to a station near Mountain Home, and reports were that if this Boise cut-off were built, the old main line through Kuna would be abandoned.[33] Then in 1886 a new plan suddenly was aired. This was for the construction of a branch to Boise from a station between Kuna and Caldwell, called Nampa.

Nampa, or New Jerusalem as it was then popularly known, was a very inconsequential place. A flag stop station for train reports had been established by the Short Line there in 1883, but for some reason no one got around to lay out a town site there for two years. Then Alexander Duffes, passing through, noticed the possibilities of the location, filed on 160 acres of government land, and surveyed the town.[34] He seems to have been strongly influenced by tradition in general and Caldwell in particular. Nampa's streets formed a gridiron of square blocks, with one street paralleling the railroad track. It may have been coincidence, too, but the street nearest the track was called Front, and the next one Main, and the main cross street was Thirteenth. The settlement struggled along without much attention for a year or two during the noisy Caldwell-Boise feud, until the time came for the Short Line, or the Union Pacific, to protect its interests by building a branch to Boise.

Nampa was ideally situated for a railroad junction. Though Kuna was five miles nearer to Boise, the grade from Nampa would be negligible, less than ten feet to the mile. And as there would be practically no way business, shortness for the sake of economy would be desirable, and Nampa, in turn, was ten miles closer to Boise than was Caldwell. So Nampa was selected. Town lot prices promptly skyrocketed. New homes and stores sprang up. Rumor had it that the Short Line soon would establish division shops there.

Boise hailed the proposed line. The papers pointed out that the costs of grading would run only about a hundred dollars a mile, and that local tonnage would insure profitable business. In July, 1886, the new road was incorporated as the Idaho Central Railroad, but was actually a controlled subsidiary of the Oregon Short Line. Its avowed intention was the building of a standard gauge road to Boise and from there a narrow gauge extension up the river towards the mining region around Idaho City. Of the proposed line the Boise *Statesman* said editorially:[35]

> As we failed to get what we wanted, we must take what we can get. A branch connection is the best that we can do just now, and it would prove a great convenience and benefit to Boise City. A great many people going west would stop over in Boise if they could come in by rail. The fifteen mile stage

[32] *Ibid.*, July 3, 1886.

[33] This cut-off was finally built from a point near Mountain Home to Boise in 1925, and all through passenger traffic then was routed over the new line.

[34] Hawley, *op. cit.*, I, 745.

[35] Boise *Weekly Statesman*, July 3, 1887.

ride, rather enjoyable than otherwise by old coasters, is regarded as a great hardship by eastern people unaccustomed to stage travel, and rather than take the stage ride give the city the go by. Moreover, while the road will be owned and operated distinct from the O. S. L., we believe the U. P. folks will make a freight rate to Boise City via the branch line no greater than is now charged to Kuna. Again, with a railroad into the city, we give our people a feeling of security and permanency, and as a result much building and improvement will go forward as soon as the road is built or its building is an assured fact. While not so good as a through line, yet there are many ways a branch line will prove a benefit to our people. In a little while the Chicago and Northwestern people will have a road running through Boise, and that with the branch road will give us all the railroads needed for some time.

Except for the last confident assertion, the editor was right. Already the Oregon Pacific had died a lingering death in the foothills of the Cascades, and the Chicago and Northwestern never reached the Rockies, let alone Boise.[36] But it was the railroad that made possible the permanent development of Western cities and towns.

Construction of the Idaho Central went ahead slowly. First money had to be raised, and not until the spring of 1887 did the actual work begin when graders moved out of Boise. Slowly the track layers followed the grade, and the hoot of the whistle on the construction train could be heard in the streets of Boise long before the rails came in view across the river.[37] Toward the middle of June the work neared completion, because after all, nineteen miles is not much of a railroad. Boise City decided to combine its grand spree of the Fourth of July with its even grander one for the completion of the road, got out its flags and bunting and made ready its cannon. Nampa had fired anvils gleefully when the work started; Boise would outdo Nampa if she had to blow all Ada County over into Oregon. The first train was scheduled for the morning of July Fourth, 1887. On the third, from Shoshone, from Hailey, from Weiser and Payette, even from Caldwell crowds headed for Nampa. And Nampa turned out in force. A swarm of citizens descended from Boise; the rest of Boise waited impatiently at home, regretting they could not be in both places at once.

Early on the morning of the Fourth the excursion trains began to pull into Nampa. The new engine of the Idaho Central, polished and painted, backed onto a string of coaches, ready to pull the special to Boise. The engineer pulled the whistle cord; the fireman tugged the bell rope; and all Nampa let out a great hoarse whoop and collectively scrambled aboard. Slowly, with rolling dignity, the train pulled out and began the run to Boise. Caldwell considered cheering.

In a little over an hour, the train reached the little new station at Boise, and the town went wild. Boise had a railroad—not a transcontinental, but the Idaho Central. Boise could smile in self-satisfaction, sniff at Caldwell, and be indulgent toward Nampa. No longer would the crowds linger around the Overland Hotel to watch the stage go out. They could go down to the depot, perch on the baggage trucks, and watch the train come in.

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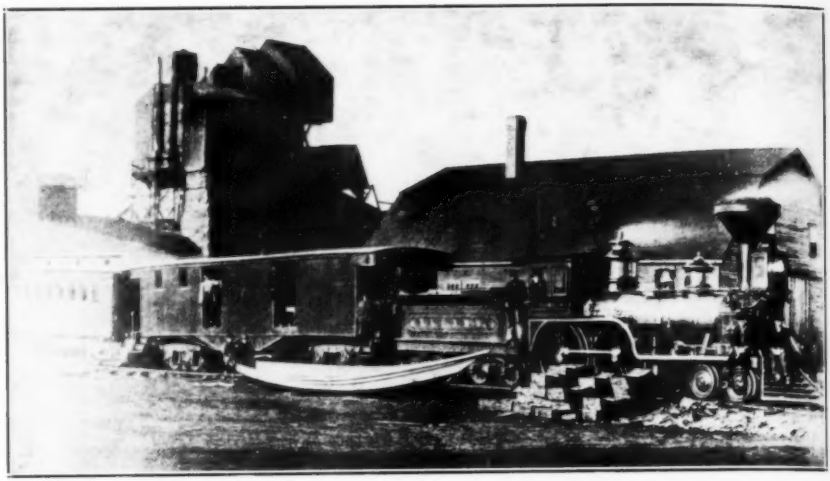
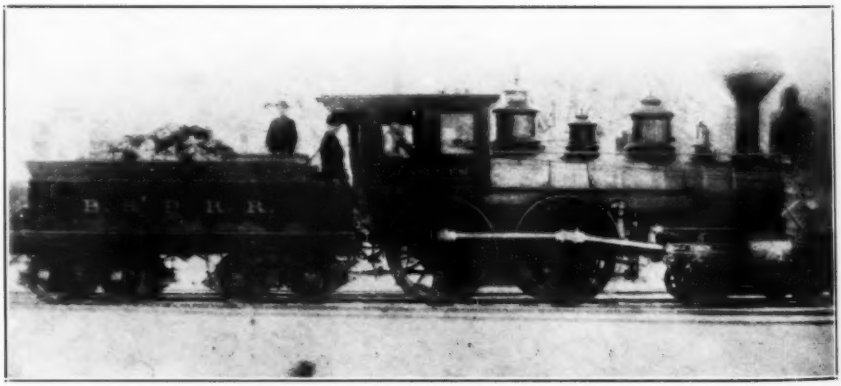
[36] Southern Pacific *Historical Outline*, p. 68.
[37] Boise *Republican*, March 3, 1887.



B. & K. I. W. 1. Amoskeag, 1852. 13x20" 60"



B. & P. "Hamlin." Portland, 1869. 14x22" 54"

Locomotives of the Bangor & Aroostook R. R.

By Chas. E. Fisher

The Bangor & Aroostook R. R. lying almost entirely within the borders of the State of Maine, is our northernmost New England railroad. It is the more recently formed and constructed of any of our New England systems.

Commencing with the *Bangor & Piscataquis R. R.*, incorporated in the State of Maine, March 5th, 1861, to build a railroad from Oldtown to Greenville at the southern end of Moosehead Lake, the project languished. By December, 1869, the road was opened to Dover and five years later it reached Abbott. From December, 1874 to December 1, 1876 the road was leased by the European & North American Ry. Upon return to the original owners, construction was again resumed and on July 14, 1884, the road was opened to Greenville, a distance of 76.5 miles.

Originally of 5′ 6″ gauge, the road was converted to standard gauge in 1877. Lumber and its products and slate were the chief commodities carried. Timber out of Moosehead Lake region was brought down to the lake in its many tributaries and the rafts floated down Moosehead Lake to Greenville whence they were broken up and carried to the saw mills of Bangor. And as a paradise for sportsmen or fishermen, who has not heard of Moosehead Lake?

On February 22, 1876, a little road known as the *Bangor & Katahdin Iron Works Ry.* was incorporated. This 18.9 mile road ran from Milo Jct. (now Derby) to the Katahdin Iron Works. In addition to iron, there were other minerals in the Katahdin region and this little road was expected to tap these resources.

To the far north lay Aroostook County, rich in timber and as we have since learned, unequalled for the production of potatoes. Incorporated on March 5th, 1891 in the State of Maine a group of Bangor men undertook to build northerly from Brownville to Van Buren with spurs to Ashland and Fort Fairfield. The state authorized Aroostook County to aid in the construction to the extent of $5000.00 per mile. This was the start of the *Bangor & Aroostook R. R.* On June 30th, 1892, the road leased the Bangor & Piscataquis R. R. and was consolidated on April 1, 1899. On the same date the Bangor & Katahdin Iron Works Ry. was leased and consolidated with the Bangor & Aroostook in 1901. Another road acquired in 1901 was the Patten & Sherman R. R., a 5.87 mile road, opened in 1899 between Patten Jct. and Patten. The road was opened from Brownville to Houlton on January 1, 1894 and to Fort Fairfield and Caribou on Jan. 1, 1895. The Ashland Branch was opened Jan. 6, 1896 and the Limestone Extension (Aroostook Northern R. R.) was opened Dec. 1, 1897. The Fish River R. R., Ashland to Fort Kent was opened Dec. 15, 1902 and was leased at the date of opening. Other lines have been built in Aroostook County as needed so that from Oakfield north, the direct line to Van Buren is via Caribou but another line to Fort Kent connects with the line from St. Francis to Van Buren. In May, 1915, the Van Buren Bridge Co. completed the erection of a bridge across the St. John River thus giving connection with the Canadian Pa-

cific and the Canadian National Railways. The capital stock is owned by and the interest on the bonds guaranteed by the Bangor & Aroostook R. R. We find in the Annual Reports references made to the Allegash Extension. It was the intention of the road to build another line northwards leaving the road at West Seboois to the mouth of the Francis River via Chesuncook Lake and the Allegash Valley. This road was never built.

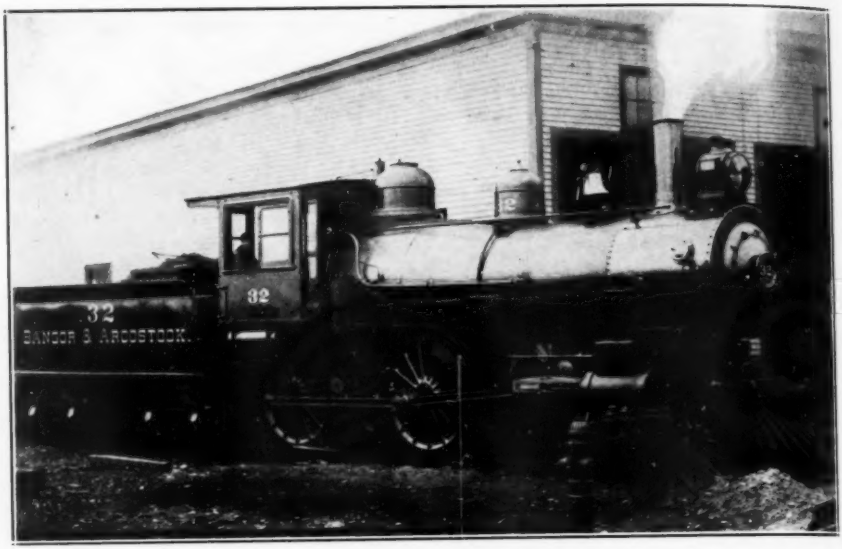
Turning to the southern end of the road, the outlet at Oldtown was not satisfactory and, in 1904 the Northern Maine Seaport R. R. was incorporated to build a line from South LaGrange to Searsport, a distance of 57.05 miles. The road was opened for service Nov. 4, 1905 and was leased by the Bangor & Aroostook from date of opening and consolidated with on Nov. 30, 1919. This gave the Bangor & Aroostook connection with the Maine Central R. R. at Northern Maine Jct., 6 miles west of Bangor instead of at Oldtown which was 12 miles east of Bangor, in addition to reaching Searsport which is on Penobscot Bay. The line from South LaGrange to Northern Maine Jct. is double track and unless some change has been made in recent years, the trains pass on the left hand tracks.

Schoodic hill, north of Brownville, limited the tonnage of freight trains and so the Medford cut-off, leaving the road at South LaGrange and joining it between Schoodic and West Seboois was completed in 1908. All of the through freight trains use the Medford cut-off, the passenger trains, on account of the towns using the old road, but in days gone by when passenger travel was a bit heavier than it is now, some of the through trains also used the Medford cut-off.

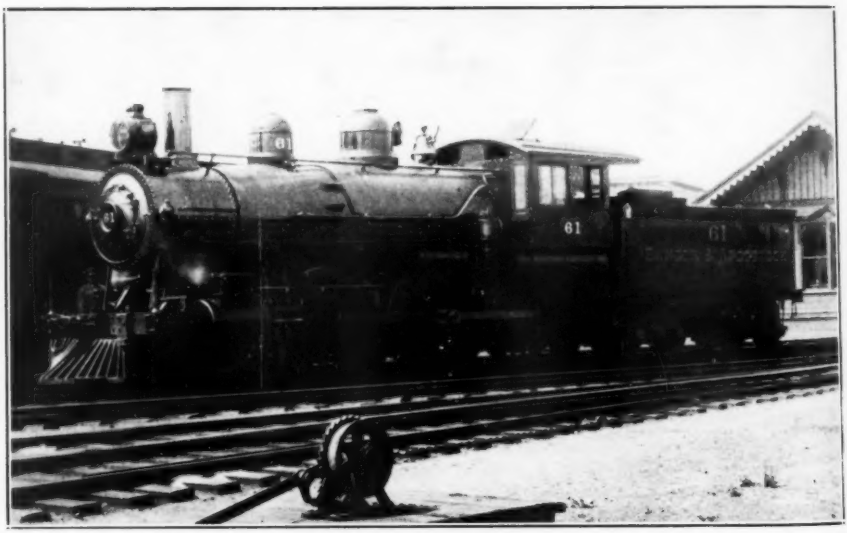
In 1906 the new shops at Derby were completed. Derby, formerly Milo Jct. is 42 miles from Bangor. Here modern shops for the repair of all equipment and, in addition, for a number of years much of the freight equipment has been built in these shops. The trucks, steel underframes and other steel work has been purchased, but all of the wood work and assembly is completed at these shops. Homes for the workmen and a hotel were also erected and Derby is strictly a railroad community.

The Bangor & Aroostook R. R. has nearly 600 miles of road. That part of the old B. & P. between South LaGrange and Oldtown and on the K. I. W. from Brownville Jct. to the works have both been abandoned. The road hauls chiefly forestry products and potatoes—the heaviest tonnage coming in the winter when the weather is severest. Trains originating in the north bring their tonnage to Oakfield, here it is assembled into trains of what can be handled over Dyer Brook and Hardscrabble hills for West Seboois. At this point the tonnage is again filled out for the balance of the trip, via the Medford cut-off to Northern Maine Jct., a certain number of turn around crews being kept in service between Oakfield and West Seboois. Needless to say, the heaviest tonnage is south bound.

The Bangor & Aroostook owns the entire capital stock of the Northern Telegraph Co., formerly owned by the Aroostook Construction Co., builders of the road. This telegraph company handles all of the commercial business along the railroad company's lines and leases certain wires to the railroad for despatching and other business.



B. A. R 32. Manchester 1895. 18x24" 68"



B. A. R. 61. Manchester, 1902. 19x26" 69"

B. A. R. 93. Manchester, 1911. 20x26" 63". Shown as rebuilt—1939

On the entire line there is not a single city since the road does not enter Bangor, its passenger trains having only trackage rights over the Maine Central. The largest town, according to the 1930 census, is Caribou with a population of 7208 and Fort Fairfield, Houlton, Millinocket and Presque Isle have over 5000 each. The road has its outlet to the sea at Searsport, it interchanges traffic with the Maine Central at Northern Maine Jct., and Dover-Foxcroft, with the C. P. R. at Brownville Jct., and with both the C. P. R. and C. N. R. via the Van Buren Bridge. Greenville, the terminus of that branch is also served by the C. P. R. and at Monson, on this same branch will be found the little two foot gauge Monson R. R. If you are hardy enough to stand the rigors of a Northern New England winter, a visit to the Oakfield Yards may open your eyes to the number of trains that can be handled on a single track. Long white trains of M. D. T. "reefers" are constantly streaming south. If you can't stand zero and sub-zero temperatures, take a ride over the road when the potato plants are in blossom—it is a sight you will never forget but don't count on a Sunday trip because the road does not operate a single passenger train on the Sabbath.

LOCOMOTIVES

Turning to first the roads that preceded the Bangor & Aroostook, we find the following on the

BANGOR & PISCATAQUIS R. R.

1	Foxcroft	4-4-0	No details. A 2nd hand locomotive probably acquired during the construction of the road.					Sc. 1898
2	Dover	4-4-0	Portland	#161	8-10	1869	13x22" 60"	Sc 1898
3	Moosehead	4-4-0	Portland	#168	12- 8-	1869	13x22" 60"	Sc 1908
4	Hamlin	4-4-0	Portland	#162	9-17-	1869	14x22" 54"	Sc 1914

Those four engines were originally of 5' 6" gauge. They were cut down to standard gauge in 1877 and new 14x24" cylinders applied to all.

5	4-4-0	Hinkley		1864	14x22" 54"	Sc 1884. Ex. Me. C. #46
5	4-4-0	Manchester	#1195	1884	16x22" 57"	
6	4-4-0	Manchester	#1172	1884	14x22" 57"	Ex B & K I W #3
7	4-4-0	Manchester		1883	14x24" 60"	Ex B & K I W #2
8	4-4-0	Manchester	#1368	1888	16x24" 57"	

With the exception of 1st #5, the above engines carried the same numbers on the B. A. R. roster.

BANGOR & KATAHDIN IRON WORKS Ry.

1	4-4-0 Amoskeag	#70	1852	13x20" 60"	Ex Mc. C. #43	
2	4-4-0 Manchester		1883	14x24" 60"		
3	4-4-0 Manchester	#1172	1884	16x24" 60"		

One other engine is supposed to have been on this road, the "Argalite", Hinkley #867, built in 1868. Built for another road, she was probably purchased by the B. & K. I. W. and assigned #2, thus preceding the Manchester engine.

PATTEN & SHERMAN R. R.

1	Burleigh	Schenectady	1869	4-4-0 16x24" 60"	Ex C C C & St. L. #367
2	Moosehead	Portland	1869	4-4-0 14x24" 60"	Ex B A R #3 (B & P #3)

When the Patten & Sherman was taken over by the B. A. R., P & S #1 was assigned B. A. R. #2, the old "Foxcroft" having been scrapped in 1898 and the "Moosehead" was assigned her old number, that of #3.

BANGOR & AROOSTOOK R. R.

In common with many roads, the B. A. R. has renumbered its locomotives in order that they may be grouped according to size and wheel arrangement. This renumbering occurred in 1907 and this list is constructed on the 1907 series. This number will be found at the extreme left, the original number following.

1	No data			Ex B&P #1. Sc 1898
2	Portland	# 161	1869 4-4-0 14x24" 60"	Ex B&P #2. Sc 1898
3	Portland	# 168	1869 4-4-0 14x24" 57"	Ex B&P #3. Sold to P&S 1899 Returned to BAR in 1901 Sc 1908
4	Portland	# 162	1869 4-4-0 14x24" 60"	Ex B&P #4—never renumbered Sc 1914
6	Manchester	#1172	1884 4-4-0 14x22" 60"	Ex B&P #6—rebuilt 1890 Sc 1898

Class A 2-6-0 18x24" 62"

1	27	Manchester #1647	1895—rebuilt to 4-4-0 & renumbered 215
2	28	Manchester #1648	1895—rebuilt to 4-4-0 & renumbered 216
3	29	Manchester #1649	1896—sold to Woodstock Ry. 1929
4	30	Manchester #1650	1896—rebuilt to 4-4-0 & renumbered 214

Class C 4-6-0 19x26" 59"

10	17	Manchester #1620	1894—scrapped 1929
11	18	Manchester #1621	1894—scrapped 1929
12	19	Manchester #1622	1894—scrapped 1930
13	20	Manchester #1623	1894—scrapped 1929

Class D 4-6-0 20x26" 62"

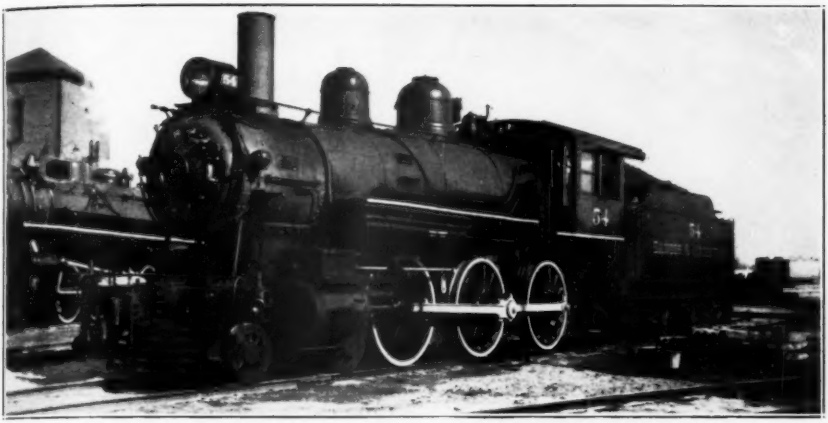
20	35	Manchester #1699	1899—scrapped 1926
21	36	Manchester #1700	1899—scrapped 1926

Class B 2-6-0 20x26" 62"

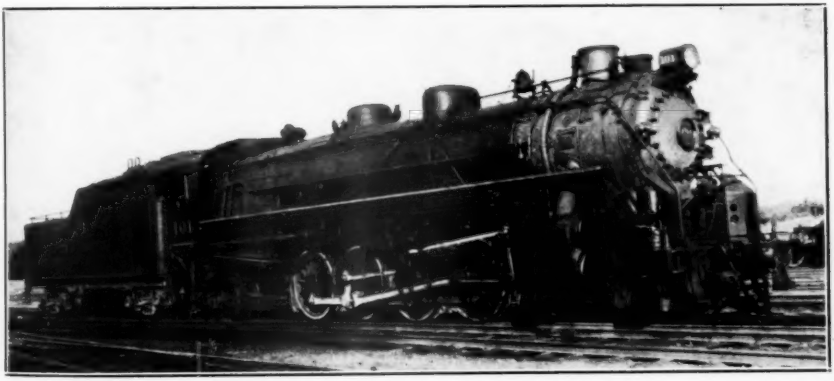
30	38	Manchester #1709	1899—sold to Atlantic, Quebec & Western, 1916
31	39	Manchester #1710	1899—sold to Hoisting Machine Co., 1917
32	40	Manchester #1717	1899—sold to Atlantic, Quebec & Western, 1916
33	33	Manchester #1697	1898—sold to Hoisting Machine Co., 1917
34	34	Manchester #1698	1898—sold to Dominion Coal Co., 1913
35	41	Manchester #1718	1899—sold to Hoisting Machine Co., 1917
36	42	Manchester #1719	1899—sold to Hoisting Machine Co., 1917

Class D-1 4-6-0 20x26" 63"

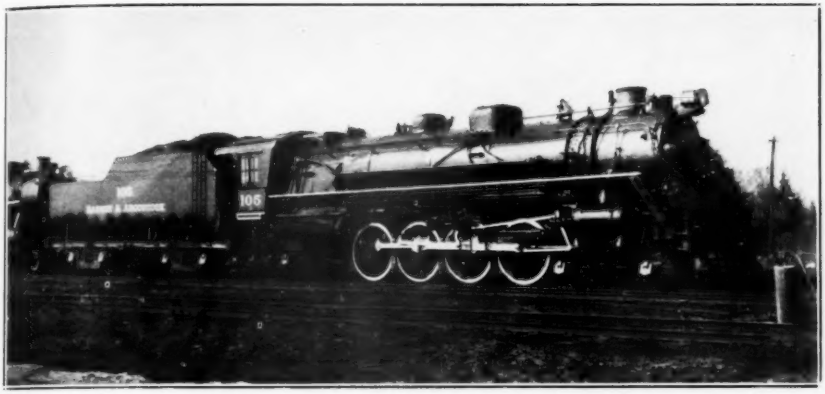
50	50	Manchester # 1788	1901—sold to Belfast & Moosehead Lake #17, 1928 Scrapped 1940
51	51	Manchester # 1789	1901—Sc 1934
52	52	Manchester # 1790	1901—sold to Belfast & Moosehead Lake #18, 1928
53	53	Manchester # 1791	1901—Sc 1935
54	44	Manchester # 1782	1901—Sold to Belfast & Moosehead Lake #19, 1940
55	55	Manchester #26022	1902—Active
56	56	Manchester #26023	1902—Sc 1933
57	57	Manchester #26024	1902—Sc 1929
58	58	Manchester #26025	1902—Active
59	59	Manchester #26026	1902—Sc 1939
60	45	Manchester # 1783	1901—Sold to Belfast & Moosehead RR. #20, 1940
61	46	Manchester # 1784	1901—Active
62	47	Manchester # 1785	1901—Sc 1938
63	48	Manchester # 1786	1901—Sc 1930
64	49	Manchester # 1787	1901—Sc 1927
65	65	Manchester #31137	1905—Active
66	66	Manchester #31138	1905—Active
67	67	Manchester #31139	1905—Active
68	68	Manchester #31140	1905—Active



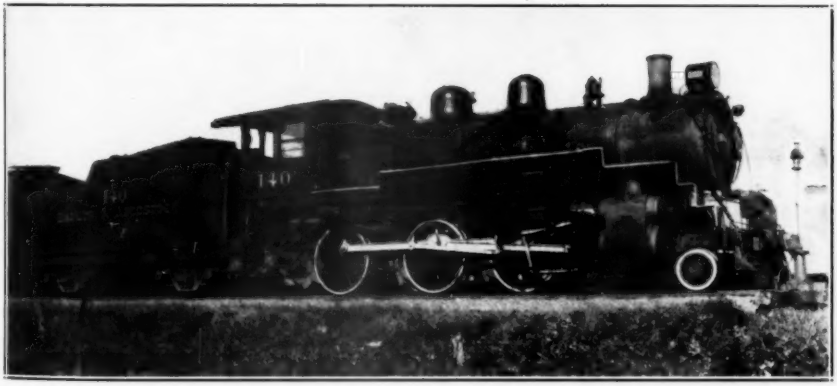
B. A. R. 54. Manchester, 1901. 20x26" 63"



B. A. R. 101. Schenectady, 1929. 22½x30" 63"



B. A. R. 105 Schenectady, 1930. 22½x30" 63"



B. A. R. 140. Rhode Island, 1906. 22½x26" 63"

69	69	Manchester #37518 1905—Sc 1937
70	70	Manchester #37519 1905—Sc 1935
71	78	Manchester #41434 1907—Active
72	72	Manchester #38813 1905—Sc 1929
73	73	Manchester #38814 1905—Sc 1935
74	74	Manchester #38815 1905—Sc 1929
75	75	Manchester #38816 1905—Active
76	76	Manchester #38817 1905—Sc 1929
77	77	Manchester #41433 1906—Sc 1931

Class D-2 4-6-0 20x26" 63"

82	Manchester #43362 1907—Sc 1935
83	Manchester #43363 1907—Sc 1936
84	Manchester #43364 1907—Sc 1936
85	Manchester #43365 1907—Active
86	Manchester #43366 1907—Sc 1935
87	Manchester #43367 1907—Active

Class D-3 4-6-0 20x26" 63"

90	Manchester #50547 1911—Superheated 1926—Active
91	Manchester #50548 1911—Superheated 1926—Active
92	Manchester #50549 1911—Superheated 1927—Active
93	Manchester #50550 1911—Superheated 1917—Rebuilt 1939
94	Manchester #50551 1911—Superheated 1928—Active
95	Manchester #50552 1911—Superheated 1918—Active

Class M 4-8-2 22½x30" 63"

100	Schenectady #68213 1929—Booster
101	Schenectady #68219 1929—Booster
102	Schenectady #68220 1929—Booster
103	Schenectady #68221 1929—Tender booster
104	Schenectady #68525 1930—Booster
105	Schenectady #68526 1930—Booster
106	Schenectady #68527 1930—Booster
107	Schenectady #68705 1935—Booster
108	Schenectady #68706 1935—Booster

Class E 4-6-0 22½x26" 63"

140	140	Rhode Island #41519 1906—Superheated 1916
141	141	Rhode Island #41520 1906—Superheated 1915
142	142	Rhode Island #41521 1906—Superheated 1915

Class G 2-8-0 23x30" 57"

170	170	Rhode Island #41522 1907—Superheated 1918
171	170	Rhode Island #41524 1907—Superheated 1918
172	172	Rhode Island #41525 1907—Superheated 1918

Class G 2-8-0 23x30" 57"

180	Schenectady #54944 1914—Tender booster
181	Schenectady #54945 1914
182	Schenectady #54946 1914
183	Schenectady #54947 1914
184	Schenectady #54948 1914
185	Schenectady #56742 1916
186	Schenectady #62626 1921
187	Schenectady #62627 1921
188	Schenectady #62628 1921
189	Schenectady #62629 1921
190	Schenectady #62630 1921
191	Schenectady #62631 1921
192	Schenectady #65970 1924
193	Schenectady #65971 1924

194 Schenectady #65972 1924
195 Schenectady #65973 1924

Note: #180 21½x30" and Nos. 182 & 184 21¼x30"

200 1 Schenectady 1869 4-4-0 16x24" 60" Ex P&S #1—Sc 1914
201 5 Manchester 1884 4-4-0 16x22" 57" Ex B&P #5—Sold Ray Lumber Co. 1913
202 8 Manchester 1888 4-4-0 16x24" 57" Ex B&P #8—Sc 1911
205 15 Manchester 1893 4-4-0 16x24" 68" Sc 1914
209 7 Manchester 1883 4-4-0 14x24" 60" Ex B&P #7—Reb 1890 Sc 1914

Class H-2 4-4-0 16x24" 69"

203 13 Manchester #1596 1893—New boiler 1921—Sc 1930
204 14 Manchester #1597 1893—New boiler 1919—Active
207 21 Manchester #1624 1894—New boiler 1920—Active
208 22 Manchester #1625 1894—Scrap 1923

Class H-3 4-4-0 16x24" 56"

206 16 Manchester #1617 1893—New boiler 1920—Sold

Class K 4-4-0 18x24" 63"

210 9 Manchester #1592 1893—New boiler 1919—Scrap 1936
211 10 Manchester #1593 1893—New boiler 1919—Sold to Belfast & Moosehead Lake #16—1927 Scrapped 1940
212 11 Manchester #1594 1893—Scrap 1937
213 12 Manchester #1595 1893—Sold to Belfast & M. L. 2nd #16—1936.

Class K-1 4-4-0 18x24" 60"

214 30 Manchester #1650 1896—Rebuilt from #4—Scrap 1923
215 27 Manchester #1647 1895—Rebuilt from #1—Scrap 1924
216 28 Manchester #1648 1895—Rebuilt from #2—Scrap 1924

Class K-2 4-4-0 18x24" 68"

220 31 Manchester #1645 1895—Scrap 1923
221 32 Manchester #1646 1895—Scrap 1924

Class F 4-6-0 18x24" 66"

230 23 Manchester #1629 1895—Scrap 1923
231 24 Manchester #1630 1895—Scrap 1923
232 25 Manchester #1635 1895—Scrap 1924
233 26 Manchester #1636 1895—Scrap 1925

Class F-1 4-6-0 18x24" 69"

234 Manchester #43369 1907—Scrap 1926
235 Manchester #43370 1907—Scrap 1926

Class C-1 4-6-0 19x26" 69"

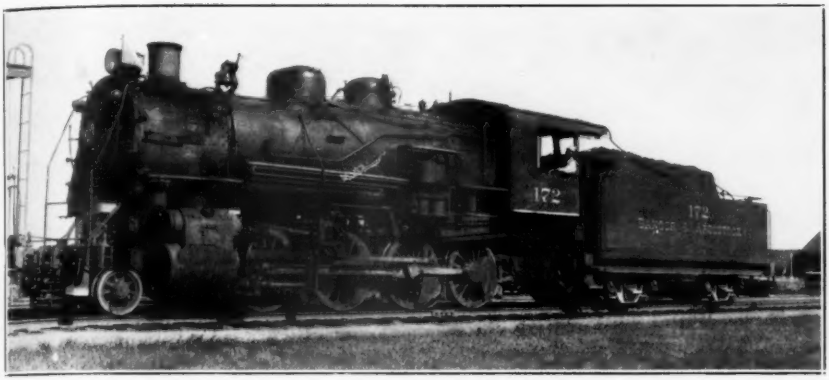
240 60 Manchester #26742 1902—Scrap 1928
241 61 Manchester #26743 1902—Scrap 1930
242 62 Manchester #26744 1902—Superheated 1926—Rebuilt 1935
243 79 Manchester #41435 1907—Superheated 1926—Rebuilt 1935
Nos. 242 & 243 19½x26"

Class F 4-6-2 21x28" 69"

250 Schenectady #64722 1927
251 Schenectady #64723 1927
252 Schenectady #64724 1927
253 Schenectady #64725 1927
254 Schenectady #64726 1927
No. 250 20¾x28"

Class L 0-4-0 16x24" 48"

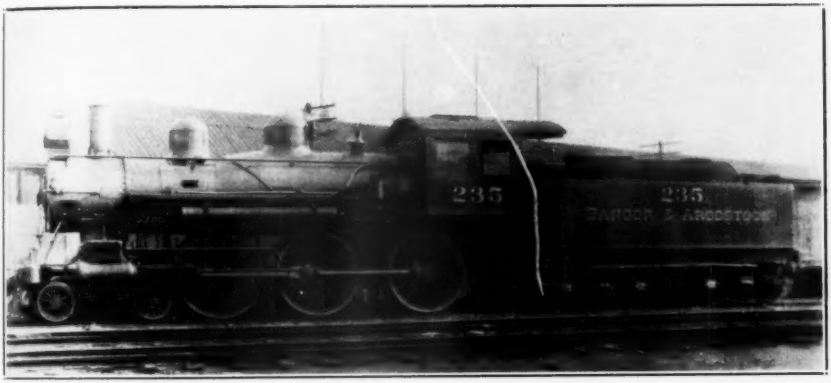
300 37 Manchester #1656 1899—Sold to Hoisting Machine Co., 1917



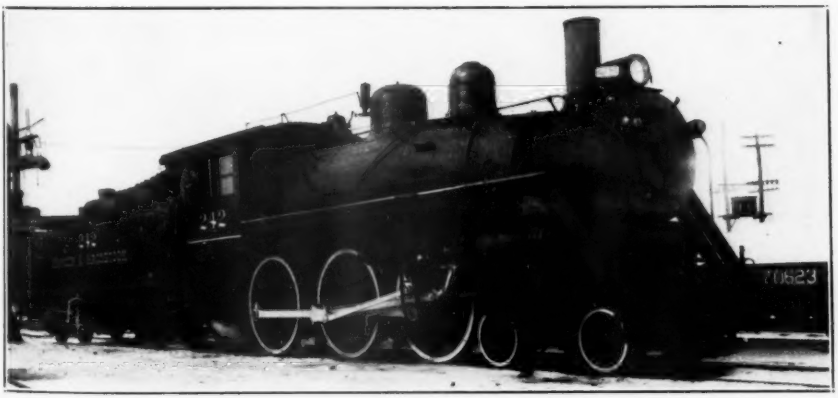
B. A. R. 172. Rhode Island, 1907. 23x30" 67"

B. A. R. 186. Schenectady, 1921. 23x30" 57"

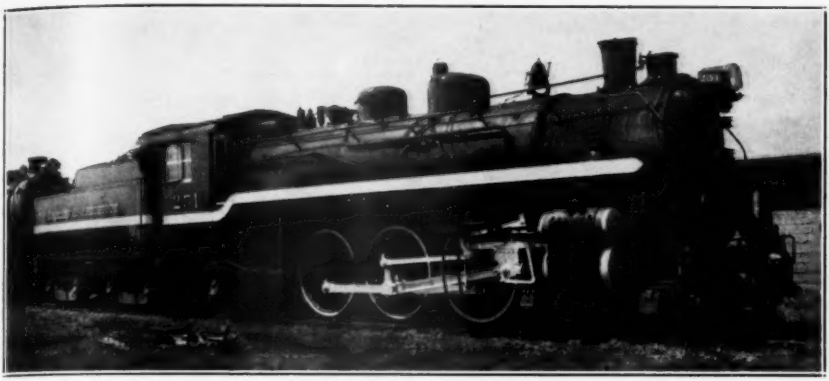
B. A. R. 207. Manchester, 1894. 16x24" 69"



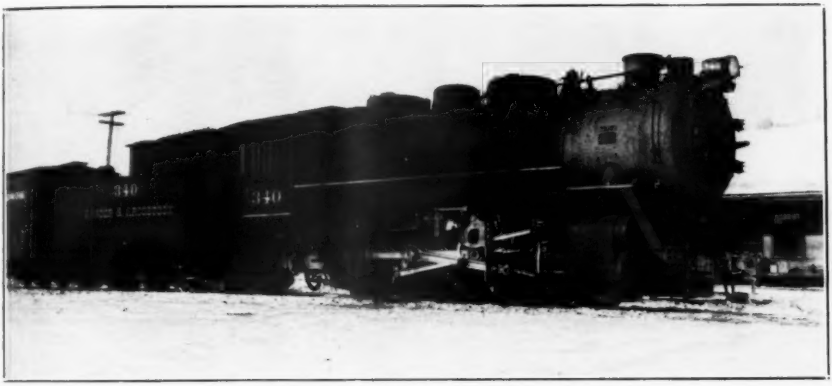
B. A. R. 235. Manchester, 1907. 18x24" 69"



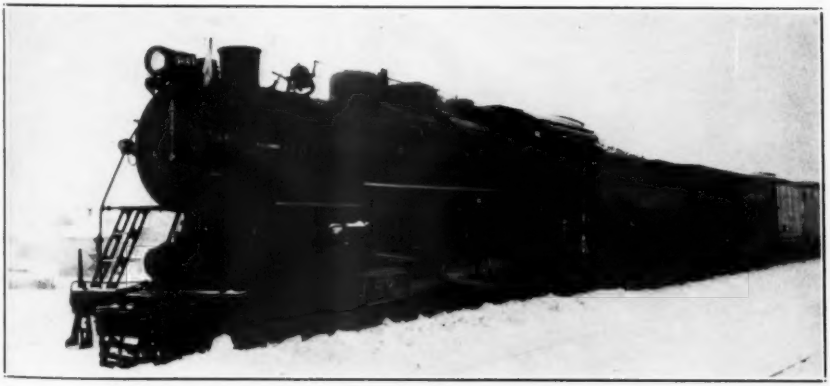
B. A. R. 242. Manchester, 1902. 19x26" 69". Shown as rebuilt in 1935.



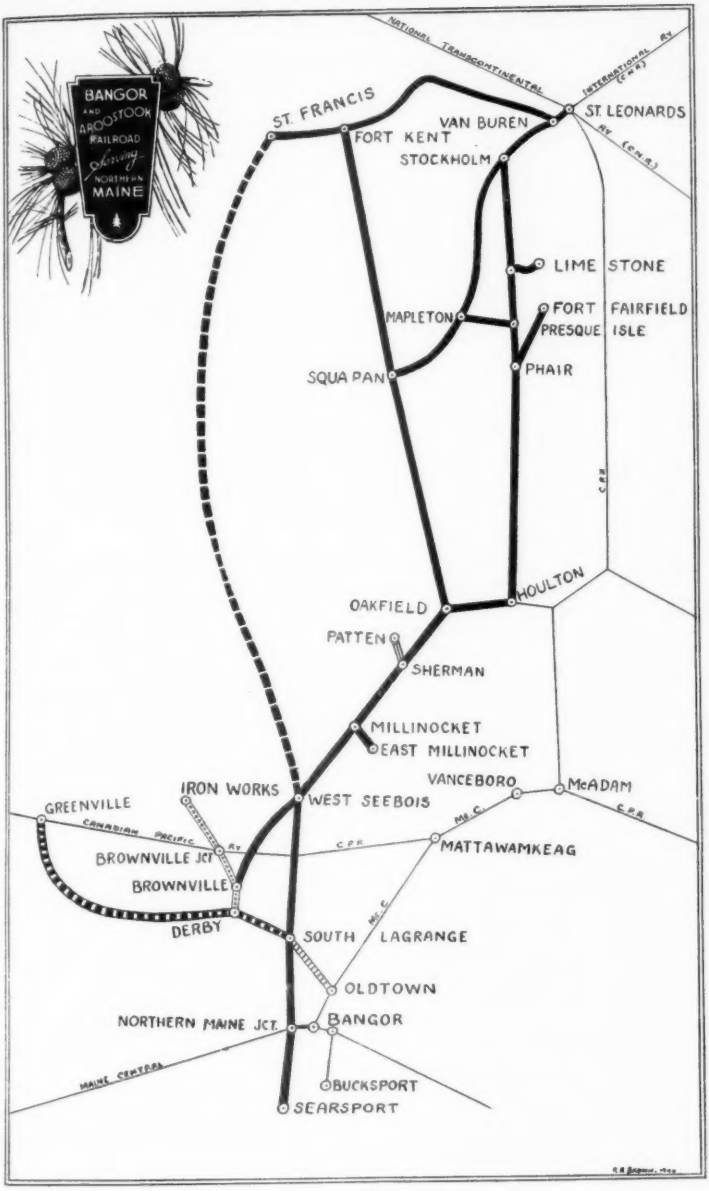
B. A. R. 251. Schenectady, 1927. 21x28" 69"



B. A. R. 340. Schenectady, 1931. 25x28" 52"



B. A. R. 403. Schenectady, 1937. 22¼x30" 63"


BANGOR AND AROOSTOOK RAILROAD
Gateway to NORTHERN MAINE
NATIONAL TRANSCONTINENTAL
INTERNATIONAL RY. (C.N.R.)
ST. FRANCIS
FORT KENT
VAN BUREN
ST. LEONARDS
STOCKHOLM
LIME STONE
MAPLETON
FORT FAIRFIELD
PRESQUE ISLE
SQUA PAN
PHAIR
C.P.R.
HOULTON
OAKFIELD
PATTEN
SHERMAN
MILLINOCKET
EAST MILLINOCKET
VANCEBORO
McADAM
C.P.R.
IRON WORKS
WEST SEEBOIS
GREENVILLE
CANADIAN PACIFIC RY.
Me. C.
C.P.R.
MATTAWAMKEAG
BROWNVILLE JCT.
BROWNVILLE
DERBY
Me. C.
SOUTH LAGRANGE
OLDTOWN
NORTHERN MAINE JCT.
BANGOR
MAINE CENTRAL
BUCKSPORT
SEARSPORT

Class M 0-6-0 18x24" 52"

310 43 Manchester #1726 1900—Sold to Dominion Iron & Steel Co., 1917
311 54 Manchester #1766 1901—Sold to Penna Equipment Co., 1916

Class P 0-6-0 19x26" 50"

320 63 Manchester #31135 1905—Scrap 1933
321 64 Manchester #31136 1905—Scrap 1935
322 71 Manchester #37520 1905—Scrap 1937
323 80 Manchester #41431 1907—Scrap 1935
324 81 Manchester #41432 1907—Scrap 1936
325 — Manchester #43368 1907—Scrap 1937

Class S 0-8-0 25x28" 51"

330 Schenectady #67669 1928

Class S-1 0-8-0 25x28" 52"

340 Schenectady #68599 1931
341 Schenectady #68600 1931

Class G-2 2-8-0 22¼x30" 63"

400 Schenectady #69022 1937
401 Schenectady #69023 1937
402 Schenectady #69024 1937
403 Schenectady #69025 1937
404 Schenectady #69026 1937

Note: Nos. 200-202, 205 and 209 did not carry any classification letter.

In preparing this material the author wishes to thank Mr. W. G. Knight, Mechanical Superintendent of the Bangor & Aroostook R. R. for the opportunity of examining the records in his office; the American Locomotive Co., for furnishing some of the construction numbers and to our Assistant Secretary, Mr. Harold S. Walker for his kind assistance in arranging and checking much of this data. In the matter of photographs, he wishes to thank Mr. J. W. Merrill for the permission to use B. A. R. Nos. 32 and 61; Mr. Harold S. Walker for No. 93 and B. & K. I. W. No. 1 and to Mr. Laurence Breed Walker in so kindly loaning the balance of the prints with the exception of the "Hamlin."

Railroads and Their Construction—Cost—Advantages

The principal object to be obtained in constructing a railroad is to form hard, smooth and durable surfaces for the wheels of the carriages to run upon. These surfaces consist of parallel rails of iron, raised a little above the general level of the ground, with a gravelled road between them; consequently, a railroad combines the advantages of good foot hold for horses, and smooth and hard surfaces for the wheels to roll upon. The wheels or rails are furnished with proper guides to keep the carriage upon the rails; and the circumferences of the wheels are made hard and smooth.

The rails for this kind of road were first made of wood, and were first used in 1680 for facilitating the transportation of coals from the pits.

By using iron, we obtain a smooth, hard, and even surface, at an expense comparatively small; and the moving power has very little more than the friction of the axis to contend against.

In discussing the merits of railroads, we have to compare them with turnpike-roads and with canals. From calculation it appears that one horse will draw 10 times as much upon a rail-way as upon a good road, and upon a canal a horse will draw 30 times as much, when the horse moves at the rate of 2½ miles in an hour, consequently, a canal is the most advantageous mode of conveyance; but when the speed is increased this ratio is reversed.

Speed and certainty are of such primary importance in commerce, that a small increase of expense is not a material object.

Both the first cost and the annual repairs of a canal exceed those of a railway; the excess varying according to the nature of the country. But in a country suited for a canal, the difference of first expense is more than compensated by a greater effect being produced by a given power on a canal than on a railway, provided the motion does not differ much from three miles per hour; and this renders a canal decidedly superior to a railway for a level country. On account of the resistance increasing in the ratio of the squares of the velocities, when bodies move in fluids, and also on account of the injury which the banks would suffer by a rapid movement of the water, the velocity of canal boats must be considered as limited to the above speed. But on a rail-road a greater velocity may be obtained with less exertion.

The great advantage of a railway will consist in its affording the means of transporting heavy goods with speed and certainty; if it be only so far as to double the speed of the fly-boats, it must be a material benefit. Up to the present time, no rail-road of any extent or importance has been constructed in this country. They are confined to England and Scotland principally.

Railways are of two kinds, according to the disposition of the flanch or rim, that is to guide the wheels of the carriages and prevent them from running off the rail. In the one, the flanch is at right angles, and of

one piece with the flat surface of the rail; in the other, the flat surface of the rail is raised above the level of the ground, and the flanch is fixed on the wheel of the carriage at right angles to the tire or iron placed on the circumference of the wheel.

Besides these, another kind of railway has lately been introduced by Mr. Palmer, which consists of a single rail, supported at some height from the surface of the ground; on this, two wheels confined in sufficient frame work as placed, suspending the load equally balanced on either side. This arrangement certainly seems to insure the grand principle of lessening friction, and doubtless will, in many situations, be found a great improvement.

Edge Rail-Heads

In this system (see Plate V, Fig. 38) the wagons run upon the rounded edge of the rail, which is smooth, and of cast iron, laid as even and regular as possible. The length of the rail is generally 3 feet, with a depth of about 4½ inches in the middle and about 2 inches broad at the top; in some railways, the rails are 4 feet long. The ends of the rails meet in a piece of cast iron, called a chair, and the chairs are fixed to blocks of stone called sleepers, with a broad base, and weighing from 1½ to 2 cwt. These should be firmly bedded in the ground and adjusted to a proper plane for the road, before the chairs are connected to them.

Wrought iron rails may be used with advantage; they reduce the number of joints, and the difficulty of making even joints has contributed much to their introduction.

A moderate degree of success depends upon the laying of the rails.

The edge railway is best adapted for permanent works, because it is easiest kept in order.

Tram Roads of Flat Rail-Roads

The rails of tram-roads (Plate V, Fig. 40) are always formed of cast iron; planks were used, and still are on some occasions. The tram-rail is very convenient for temporary uses; it is much used in quarries, mines, forming new roads, and digging canals. Tram-rails are very weak however.

As tram-rails are applied with much benefit in forming temporary ways, the most ready way of putting them down is of some importance. The common method is, to fix them with nails or spikes upon cross sleepers of wood. This is inconvenient on account of the difficulty of drawing the nails when it is necessary to move them.

Le Caan's tram-plates are the best, as they are fixed without nails. The plates are joined by a dovetailed notch and tenon; and an oblique plug is cast on each plate, which is let into the stone sleeper. But for the advantage of repairs, at every 30 yards there is a plate with a perpendicular plug. These plugs are 1¾ inches in diameter, 2½ inches

long, and have an obliquity of about 8 degrees. A small groove is left in the plug to permit the water to expand. The plate should rest firmly upon the sleepers.

The plates are about 3 feet long, 3½ inches broad on the top, and ¾ of an inch thick, and weigh about 42 pounds. They are variable, however, and should be adapted to the work to be done upon them.

Single Rail-Road, or Palmer's Railway

On this novel and ingenious rail road, the carriage is drawn upon a single rail, the surface of which is raised about 3 feet above the level of the ground, and supported by pillars placed at equal distances, about 9 feet apart.

The carriage consists of two receptacles or boxes suspended one on each side of the rail by an iron frame, having two wheels of about 30 inches in diameter. The rims of the wheels are concave and fit to the convex surface of the rail; and the centre of gravity of the carriage, whether loaded or empty, is so far below the upper edge of the rail, that the receptacles hang in equilibrium, and will bear a considerable inequality of load without inconvenience, owing to the change of fulcrum from the breadth of the rail, which is 4 inches. The rail is made capable of adjustment and may be kept straight and even.

The advantages of this arrangement consist in its being more free from lateral friction than even the edge railway.

Moving Powers for Rail-Ways

In the economy of rail-roads it is of the greatest importance to consider the nature and effect of the different species of power that are likely to be applied to them. These are, *horse power*, and *steam*.

When the power of a horse is to be applied to move a carriage on a rail-way, it is obvious that we should endeavour to apply it in such a manner as will produce the greatest quantity of useful effect, with as much speed as can be obtained without injury to the animal. Hence the two objects of inquiry are, the duration of a day's work, and the *maximum* of useful effect.

The time assigned for the day's work of a horse is usually 8 hours; but we are certain that some advantage is gained by reducing it to 6 hours.

The speed which corresponds to the maximum of useful effect is of considerable importance, as the expense of horse power very much depends on it.

The greatest distance a horse can travel day after day without injury is the limit of velocity, and the work must be nothing.

It is obvious, that when a horse travels at such a rate that the empty carriage is equal to his power, the work done is nothing. On the other hand, the load may be so great that the horse can barely move, in which case, also, the useful effect is nothing; but between these two extremes there is a *maximum* of effect, and therefore advatageous.

The velocity which gives the greatest effect is half the extreme velocity when unloaded. The extreme velocity of a horse is 6 miles per hour when continued for 6 hours, and therefore, 3 miles per hour must be the velocity corresponding to the *maximum* of useful effect, when the time of labour is 6 hours.

Steam power we shall consider when we treat of locomotive carriages.

With respect to carriages for rail-roads, small carriages are evidently both heavier and more expensive, in proportion, than large ones. The carriage cannot be much enlarged, however, without increasing the number of wheels.

When a carriage has more than four wheels the body must be so sustained that its pressure may be divided equally among the wheels.

The load on each wheel must be limited to suit the strength of the rails; it will seldom exceed two tons on a wheel.

Perhaps the most advantageous load will be about 1¼ tons on each wheel, which will require an axis of 3 inches in diameter. The size of the wheels is the next point to be considered; it is well known that large wheels are the best. But, practically, they are limited to about 4 feet 6 inches, or, at most 5 feet if made of cast iron, and if of wood this size cannot be much exceeded without rendering them very heavy.*

When horses are employed to draw carriages on a rail-way, the traces should be attached so that the horse may draw in an ascending direction, as this direction gives a horse much advantage to draw a load forward. Where considerable speed is to be produced by horses on a rail-way, it will be necessary either to have the horses behind or at the sides of the carriage in order to prevent accidents.

There are few subjects in the practice of Civil Engineering which demand so much particular information, profound skill, and such extensive views of the effects of trade and commerce, as the selection of a line for a railroad or a canal.

The interests of agriculture must be understood, and such arrangements made as are likely to benefit the land owners through whose lands the line passes.

In consulting the interests of a manufacturing district, it must be recollected, that "time is an important element in all commercial transactions."

Where a considerable tract of country is to be examined the best index to its elevations, is its streams and rivers; these indicate every change of inclination.

In a survey for a line of railway our attention should be directed to the attainment of the same objects as for a canal, except water only; the plan for a rail-road is made in the same manner as before laid down for canals.

But, in proceeding to fix the exact line, it ought to be ascertained, whether the trade will be an equal one in both directions or not. If

* Mr. Strickland says, that the wagons most in use on English Railways weigh three tons, including the lading, running upon cast iron wheels three feet in diameter.

an equal trade is likely to be established, then the line should be as level as possible. If a permanent unequal trade be the only one that can be conducted by the railway, and many will be of this kind, then, there is one inclination best adapted for the trade. The following is the practical rule for finding this inclination.

Rule. To the tonnage in each direction add the weight of the wagons required to carry the greater tonnage, divide the greater sum by the less, and make the quotient, diminished by one, the numerator, and the same quotient with 1 added, the denominator of a fraction. Multiply this fraction by the fraction representing the resistance on the level rails, and the result will be the fraction showing the best inclination for the trade.

Suppose that for every 1000 tons of goods or minerals that will go in one direction 500 tons will be returned; and let the weight of the wagons to carry 1000 tons be 250 tons. Then 1000 tons added to the weight of the wagons will be 1250 tons. Also, to 500 tons add the weight of the wagons, the sum is 750 tons. Divide 1250 by 750, it gives 1.666. Then subtract 1 for the numerator and add 1 for the denominator, and we have .666/2.666 or ¼. Now, if 1 lb. will draw 130 lbs. on a railway, ¼ times 1/130 equals 1/520, or the descent should be one part in 520, or near 10 feet in a mile.

The inclination being determined, we proceed to ascents and descents.

Where either horse power or the steam carriage is to be employed, every ascent or descent, which cannot be overcome without the aid of a stationary steam engine, must be avoided, unless the expense of cutting and embanking will exceed the delay and expense of an engine, &c.

When stationary engines are to be employed throughout the line, the height of the ascent or depth of descent is immaterial, provided, it not be too abrupt and deep; and the deep cutting may be avoided. Embankments should be made firm, and the slopes of embankment and excavation should be such as to prevent their injury from the weather.

Where good stone is at hand, a ravine may be crossed by arches similar to ancient aqueducts.

It is desirable that all rail-roads should be of the same breadth; generally this breadth may be limited to 4 feet 6 inches for heavy goods, and 6 feet for light carriages. For a single track the breadth to the outside of the rails 5 feet, 3 feet on each side for paths, and 4 feet on each side for hedge and ditch, or a total width of 19 feet; if the track be 6 feet wide, 21 feet will be required. For a double track, 28 feet for heavy carriages and 32 for light ones. A double track for each species would not require less than 56 feet.

On all rail-roads there should be passing places at certain parts of the road; these are composed of one double, and two single branches, their top surface having a groove so that the rim on the wheels may move in it when turned off from the straight line by the single branch or tongue; in single tracks these should be frequent.

We now proceed to the *construction* of rail-roads.

There are two kinds of rails which succeed in practice; these are the cast and wrought iron ones. Wrought iron does not last so long as cast iron when exposed to the air and weather. A cast iron rail is more liable to fracture than a wrought iron one, even when made of the best of iron, and the force that would break a cast bar would only bend the wrought one, which would not interrupt the traffic on the road.

The form of cast iron rails should be such as to give the most strength with the least material. The breadth being uniform, the outline of the depth should be a semi-ellipse, so that the rail may be equally strong at every point. To settle the cross section of a rail, the breadth of the upper edge should be fixed, this breadth should be proportioned to the load to be supported and the size of the wheels; the larger the diameter of the wheel, the greater the surface of contact; and, consquently for large wheels less breadth is necessary. The breadth of the top should be an inch for each half ton of stress on one wheel.

The mean thickness should not be less than half the breadth of the upper surface; and the least thickness not less than ½ an inch.

Malleable iron rails have been applied only as edge-rails. As wrought iron is as soft, if not softer, than cast iron, it is obvious that the rails should be at least equal in breadth on the upper surface; the following are nearly the dimensions for these rails: An inch in breadth at the top for each half ton of stress on one wheel, and the average thickness, ⅜ of the top breadth.

Wrought iron rails are far preferable for roads where it is proposed that the carriages should travel faster than 3 miles per hour, on account of the great danger arising from a broken rail. Roads formed for the reception of rails should have all the accessories belonging to a common road for carrying off the water, &c. A continued trench should be formed under the rails, about 2 feet broad and 10 inches deep, and filled with small fragments of stone upon which the sleepers or blocks are to be placed. These blocks should be about 16 inches square, and in thickness about half the base. In a soft soil the trenches should be deeper and broader. And well filled with stone.

In districts subject to severe cold, the sleepers should be much larger and greater precautions used in laying them.

Rule for the best Length for Rails of Rail-Roads

The price of a ton of iron delivered on the rail road must be known, and also the price of the chair, stones, and setting of one support. Then divide the price of a ton of iron by the price of one support, both being in dollars; square the quotient and multiply it into the breadth of the rail in inches, and this product by 1/20 part of the weight of the loaded wagon in pounds, and extract the cube root of the product. Divide 700 by the cube root found and the result will be the distance in feet.

This is for cast iron. Every precaution should be adopted for keeping the rails dry.

Locomotive Engines

A locomotive engine is a steam engine placed on wheels, in such a manner, that the force of the engine can be applied to impel these wheels and by that means draw along a train of wagons.

It may be thought by some that rack work is necessary in order to cause the engine to move on the rail surface, but it has been found that with a proper inclination to the rail and pressure on the wheels, there is no danger of the wheels sliding.

In consequence of the small weight and simplicity of the operation of high pressure steam engines, they alone appear to have been used on rail-roads; they work at a pressure of from 30 to 50 pounds on the square inch, above the atmospheric pressure.

If human prudence could be relied on, all the objections to this kind of engine might be obviated.

The velocity of this kind of engine, is limited only by the expense and risk of accident. But there is a velocity for steam engines which gives the *maximum* of useful effect, as well as in horse power.*

The *maximum* power depends on the structure of the engine. If the steam piston exceeded a certain velocity it is obvious that the boiler would not be capable of affording the requisite quantity of steam; the moving force and length of the stroke, when the resistance is the friction of the piston only, limit the velocity of the piston.

Twice the proper velocity of a steam engine produces the *maximum* of useful effect, as in the case of horse power. Low pressure engines are deemed unfavorable for moving steam carriages, on account of the complexity of the apparatus, and the weight of water necessary for condensation; and the bulk occupied by the one and the immense quantity of the other, render it quite improbable, that they can ever be employed with much advantage.

Fixed, or Station Engines

Conceive that the whole line of road is divided into short stages, and that an engine is placed at each of these to work an endless chain, extending the whole length of one or more stages, and running upon pullies or rollers; also, that by simply moving a handle of a level to a friction apparatus, a carriage can be connected in an instant, if necessary. Thus any quantity of carriages could be moved at the same time, not exceeding the power of the engine.

We next proceed to compute the extent to which motion could be conveyed by an endless chain supported on rollers.[1] The greatest stress a chain ought to be exposed to, is equal to the weight of half a mile of chain; consequently, the weight of chain to serve for one mile will be twice the moving power of the engine, supposing the engine to draw in both directions at the chain; but if the rollers be properly formed the

* Mr. Strickland says that, in order that a locomotive engine may be used with advantage, the road should not deviate more than 3/16 of an inch to a yard from a horizontal.

[1] Ropes are frequently used for the same purpose; they are generally about one mile in length.

friction will be only about 1/100 part of the weight of the chain, and consequently 1/20 of the power will be lost in moving it, when the engines are 2½ miles apart, and so on, till at 50 miles apart, the whole power would be expended in moving the chain.

From 8 to 10 miles may be considered the greatest distance from station to station to be adopted in practice.

It is obvious that a system which requires an engine at every tenth mile is only adapted to extensive traffic.

The *maximum* velocity for a low pressure engine bears the same relation to the length of the stroke as in a high pressure one.

We now come to consider the most important point in all systems, the expense.

The first cost of a rail-road must be considered, then the annual expense and the rates of tonnage that will be equivalent to it, supposing the probable tonnage to be ascertained. In calculating this expense the following are the principal items to be considered.

1. Expense of examination, surveys, superintending the works.
2. Value of the land required, expense of ditches and drains, &c.
3. Expense of cutting, embankment, and levelling.
4. Expense of bridges, tunnels, acqueducts, &c.
5. Expense of road, and stone sleepers.
6. Expense of rails, chairs, pins, and fixing the same.
7. Expense of engines for inclined planes, chains, rollers, &c.
8. Amount of damage to property and small expenses.

The average cost of a proper railway with a double set of tracks will not be less than 23,000 dollars per mile, when all the expenses are paid. It is stated that in England the average of a number of railways, of all kinds, containing 500 miles is nearly £4000 per mile, and allowing for imperfections, they will now cost £5000 per mile. The same author estimates the cost of a canal, under similar circumstances, at double that of a railway, £10,000 per mile.

The first cost of a turnpike with 16 feet of well made road will, on an average, cost $5000 per mile.

It has been found in England that it will cost 2.4 farthings sterling to transport a ton one mile on a rail-road, when the carriage is moved by horse power; when the locomotive engine is used, it will cost .43 of a farthing per ton per mile; if by means of stationary steam engines, it will cost 1.68 farthings.

When it is recollected that on a railway goods may be propelled with more than twice the velocity that can be had on a canal, without an increase of expense for the conveyance, we should think it rarely advisable to cut a canal in preference to making a railway, except in certain cases.

For further details upon railways the student is referred to "Tredgold on Rail Roads," and "Wood on Rail Roads" from which works the above details are extracted.

From—"An Elementary Course of Civil Engineering" translated from the French of M. I. Sganzin in 1828. Submitted by Mr. Hugh G. Boutell.

Early Air-Conditioning of Railway Passenger Cars

By Carl F. Graves

(A paper read before the New York Chapter of the Railway and Locomotive Historical Society.)

Air-conditioning, of which we hear so much lately, was experimented with, and used after a fashion, as far back as 1860, nearly seventy-five years ago. Because this fact is so little known, the general public tend to regard the subject as something entirely new in the field of transportation.

As early as the year 1844, Henry Jones Ruttan, who lived in the town of Coburg, West Canada, and who was employed as a sheriff, became interested in the matter of ventilating houses. He studied this subject thoroughly, and succeeded in making considerable progress in his quest, and rapidly built up a name for himself as an authority.

While engaged in this work, Mr. Ruttan was obliged to travel considerably, and to suffer, like all other travellers, from the frightful conditions which existed aboard the trains, due to dust and cinders, poor air and improper temperatures. As a result of these numerous trips, made under the worst of conditions, Mr. Ruttan decided to abandon his work of ventilating houses in favor of devoting all his time to devising a scheme for ventilating as well as for heating railway passenger cars.

Over fifteen years were spent by Mr. Ruttan in research and experimentation, during which time much of his personal savings were spent in trying to perfect his ideas. He finally produced what was known as the "Ruttan System of Heating and Ventilating Railway Cars," which system effectively provided for the efficient warming of the cars in winter, and protected them against the inrush of dust during the summer months, as well as providing the cars with cooled air at the same time.

When Mr. Ruttan first tried to interest the railroad officials in his particular heating and ventilating system, he offered, as an inducement, to warm and ventilate one car of any road interested upon the mere payment of expenses, but he met with considerable opposition on all sides, since others before him had already advanced so many costly but worthless ideas along the same line that the railroads had become justifiably suspicious. However, Mr. Ruttan persevered, and before long was additionally aided by the fact that conditions of travel became so intolerable to travellers that the railroad patronage in general began to fall off. When this state of affairs came about the railroad managers were only too anxious to listen.

One of the first of the roads to co-operate with Mr. Ruttan in his experiments was the Grand Trunk Railway of Canada, which soon had seven cars equipped with the new system in operation over its lines. Later, the Boston & Lowell and the Nashua & Lowell lines became interested, and they too began to operate experimental cars.

The method of ventilating these cars, as practiced by Mr. Ruttan, was as follows: The air was received in what the inventor called a "receiving box," located on the top of the car. This receiving box had two

pairs of self-acting valves, so placed as to receive a current of air regardless of the direction of motion—the current opening one pair and shutting the other. These valves looked like small doors, and moved on hinges.

From the receiving box the air was propelled down the sides of the car, through two flues, (located one on each side), into a water tank situated under the floor of the car. This tank was about sixteen feet long by nine feet wide, and it contained two-hundred superficial feet of cold water, maintained at a depth of two inches. It was so arranged that the fresh air was compelled to traverse the whole surface of the water before it could rise into the car, so that all the cinders and the dust, which usually entered, remained deposited in the water.

From this tank, the air passed into the car through two air tubes, which Mr. Ruttan called "pedestals," or "dischargers." They stood upright in the center of each row of seats, and were about five feet high. They resembled ornamental chimney tops, and had two openings, each nearly a foot wide, one toward each end of the car.

From these openings the air was exhausted, and passed just over, or even with, the heads of the passengers. The air in the cars was discharged at a rate dependent upon the speed of the train. The quicker the car moved, the greater the quantity of air which was forced through the system. It was estimated that the air in the cars was discharged every two minutes when the train was moving at a rate of forty miles per hour. The foul air escaped through wire openings near the floor, inside the car, and directly under the receiving box, and was carried off by a "chimney" or flue after the length of the car had been traversed.

It was claimed that the atmosphere inside the car, kept at a constant pressure by the air forced from the dischargers prevented the entrance of dust and cinders at the windows.

In the winter the pedestals, or dischargers, were taken up, one aperture was closed, and a peculiar style of "stove" was placed over the other. By this arrangement the air in the car was warmed; and in addition the feet of the passengers were warmed, since the hot air, in its course through the system, flowed through a flue located under the floor of the car, directly under the row of seats. With this stove in operation, it was claimed that the entire amount of air in the car was changed every six minutes while the train was in motion. This stove arrangement occupied no more room than the ordinary stoves that were in common use at the time, and the entire cost to fit up one car, including the stove, did not exceed sixty dollars.

The trials of Ruttan's system lasted quite some time, and were made by many roads of the East. The New York Central Railroad and the New York & Erie both tried out experimental cars on their lines, but after a time gave up the matter, since the trials did not result entirely to the satisfaction of the managers.

Mr. Ruttan had his idea patented, under number 52009, on January 9, 1866, and worked along with it for quite a while afterward, but with little success. He was finally obliged to give it up entirely, since all interest in it on the part of the railroads had waned.

Meanwhile others had been interested in the same idea—that of improving ventilating conditions in railroad cars—and several rather interesting and unique systems were put before the public in general and the railroad officials in particular.

On May 15, 1855, a man named Job R. Barry received under the number 12,851, a patent for an "Improved Ventilating and Cooling Apparatus" for railway cars, which actually did work in spite of its number of complicated parts, and its general bulk. The "mechanical" part of the apparatus was carried in a huge box, hung under the floor of the car, and situated adjacent to another box filled with ice. In the first box, at the bottom, was a tank of water. Actuated by a belt running over an axle pulley, a wheel resembling a paddle-wheel on a boat, revolved to about one-quarter of its depth in this water. Leading into one side of this "wheel-box," and pointing directly to the "paddle-wheel," was an air duct which led from the interior of the car. On the other side of the paddle-wheel, in the same box, there was another air duct leading out, and entering the ice-box at a point just above the level of the ice it contained.

When the train was in motion, the paddle-wheel was driven by the turning of the car's axle. The turning of this wheel agitated the water in the tank, and wet the paddles of the wheel at the same time. It also created a suction which drew foul air from the car's interior. This air, as it entered the box from the incoming duct or flue, passed over the wet paddles of the turning wheel and was considerably cooled; and much of the dust and cinders which it contained were removed in the same manner as in the system devised by Mr. Ruttan.

After the air had become somewhat cooled by its contact with the wet paddles, it was drawn out through the flue on the opposite side of the wheel box, and into the ice-chamber, where it was further cooled. From there the air flowed through a duct leading to the interior of the car. No provision was made for warming the car in winter, and it is presumed that the ordinary Baker heater was employed, and the ice-box feature of the system cut out of service for the time being .

On May 8, 1855, a patent was granted to Mr. D. H. Fox and a partner named Fink, under the number of 12,818, for a method of cleaning the air in passenger cars. This device was used for some little time, but like other similar schemes was not perpetrated. In this system there was a long shallow chamber in or on the top of the car, which communicated at several points with the interior, and by a tube with a fan chamber located beneath the car. The motion of the car caused the fan in this chamber to revolve, creating a partial exhaust or vacuum which, in turn, produced a number of upward currents simultaneously in various parts of the car. These currents were sufficient to carry off the vitiated air and dust.

Another system, little used, however, was invented by Mr. V. P. Corbett, of Corbettsville, N. Y. It was patented by him on March 21, 1855, under number 12,541. This system was composed of a series of vent holes located in the sides of the car, between the ceiling and the windows. Placed within these holes were vertical ventilating fans, so ar-

ranged as to be revolved by the rapid movement of the car through the atmosphere, thus exhausting the impure air from the inside of the car.

Another person identified with the attempts to better the conditions then existing in railroad travel in so far as the ventilating of passenger cars was concerned, was a certain E. C. Salisbury, of New York City. While Mr. Salisbury did not confine his efforts so much to the matter of cooling the air in cars, he did devise a system which, in a way, excluded the dust and it was actually used on several roads with comparative success.

In Mr. Salisbury's system, the sides of the car were carried, by means of canvas or a light frame work, within two or three inches of the track. To the platforms of the car were attached what were termed spring platforms, which made a perfect union or joint when the cars were coupled. This spring platform was also carried down to correspond to the sides of the car. This arrangement prevented to a great measure the disturbance of dust on the track, and rendered it impossible for it to rise into the cars, for the reason that no current of air from beneath could enter them. All of the currents of air created were parallel to the line of motion. By this contrivance, the whole train was virtually converted into one car instead of being cut into as many parts as there were cars.

While all of these schemes were tried considerably, none lasted very long, and it was not until years later that the subject was revived, probably because the whole subject of air-conditioning was too far ahead of its time to warrant serious recognition by the travelling public.

The Rouses Point Bridge

By Laurence Doherty

A bridge is a structure whose importance varies directly with the importance of the points it connects. Some bridges merely fill gaps between adjoining points of land, while others figuratively, if not actually, span a continent. At the time of its construction, the Rouses Point bridge was one of the latter. Newer routes have lessened its importance but the part it played in the early transportation system of our country warrants that its history be preserved.

Like most youngsters and "Railroad Hobbyists," next to the locomotive the rear platform is a most advantageous point to ride on a train. Twice yearly when the family went "down east" or whenever we went for a trip, which was quite often, the back platform was my favorite vantage point. One of my earliest railroad impressions is that of a shining expanse of blue water—Lake Champlain, across which our train slowly crept, miraculously supported by a web-like maze of timber. Possibly this early association fostered an interest in this structure, probably it would have developed anyway, but the old bridge, in storm or calm has always aroused my respect and interest.

New England, or more particularly Boston, wanted a thru route to the West. Railroads in the 1840's had connected Boston with the east shore of Lake Champlain, the terminal route having been the Central Vermont. Agitation in Northern New York State for a railroad from Lake Champlain to the St. Lawrence river at Ogdensburgh, New York, gave Boston its chance of a route west, and, to its credit, Boston took the plunge financially. It is interesting to note that a great deal of opposition to this proposed railroad came from New York City, but, despite this, a charter to the "Northern New York Railroad Company" was granted by the legislature in 1845. The road was opened for service in late October, 1850. The eastern terminus of the road was a long pier, some 1250 feet in length extending out into Lake Champlain from the New York shore at Rouses Point. Boston wanted the gap closed from this dock to the Central Vermont trackage at Alburgh on the eastern shore of the lake on the Vermont side, knowing that to attain this goal would give them a huge, competition-free western market for finished products and a source of all the raw materials the East could want.

New York City also saw the advantage to Boston if this route could be established and sought to prevent the construction of the proposed bridge. A bitter fight followed in the New York Legislature, during which the New York bloc contended that such a bridge would impede navigation on the lake and would render approach to a United States fort, located just north of the proposed structure, impossible. The fight continued for several years, during which time mass meetings of 10,000 persons were not uncommon. The railroad company asked, and was promptly denied, permission to go thru Canada. Feeling ran high in Northern New York, and, eventually, thruout the State, with the

The Rouses Point Bridge to the right.

—Courtesy of D. P. Church

result that William A. Wheeler, a resident of Malone, New York, and later Vice-President of the United States, succeeded in lining up the anti-New York forces, along with other section blocs seeking special favors from the legislature. The united front thus established wrested a charter from the yet unwilling legislature in 1849.

This bridge charter contained a provision that 300 feet of the lake must be left open for navigation. By this clause the New York city forces hoped to "stump" the efforts of the builders. It was thought that no system could be devised which would work satisfactorily, and that, eventually, the northern New York commerce would make necessary the building of a railroad south along the west shore of Lake Champlain, which, in turn would connect with railroads entering New York City.

As we shall presently see, these opposing forces reckoned without the proper respect for the inventive and ingenious abilities of Mr. Henry R. Campbell of the Central Vermont and Mr. Chas. L. Schlater of the Northern New York Railroad. The extent to which these men overcame what appeared to be an insurmountable obstacle is clearly indicated in the quotation from the pen of a contemporary writer. I am indebted to Mr. C. L. Terroux, Vice-President of the Railway and Locomotive Historical Society of Canada for the following description.

". . . . But the place is one of more immediate interest to the tourist or traveler on account of the remarkable railway connection, which, by the exercise of extraordinary enterprise, mechanical ingenuity, and perseverance, has been here effected between the Vermont & Canada and the Ogdensburgh Railroads, and by which, not only those two important lines, but the two states of Vermont and New York, before accessible to each other for a hundred miles along their borders only by water craft, have become connected by an unbroken line of rails extending over bridge and bridge-boat a mile across the lake, as very accurately exhibited, together with the portion of the surrounding lake scenery, in the accompanying view, taken a short distance in front of the railroad station, on the Vermont side of the lake.

This bridge, in its whole length, is 5,290 feet, or one mile and two rods, and was erected at a total cost of $60,000.00, of which about $20,000 were expended on the draw, or, as it is usually and perhaps more properly called, the boat bridge. Three fifths of the whole structure, including the boat bridge, were built by the Vermont and Canada and Vermont Central, and the remaining two fifths by the Ogdensburgh railroad. The boat bridge, or that part which swings open to permit the passage of vessels, and is thus made to serve the purposes of a huge draw, is of the great length of 301 feet, and is an entirely independent structure in fact, a regular boat, with iron rails running over its deck, and so brought to the level and line of the adjoining bridge and track, at the ends, by substantial and secure fastenings, that the whole is brought into a perfect junction, and made to form a continuous line of rails from one side of the lake to the other. In a side hold of this boat was placed a small steam engine, which, by winding up on a drum a strong iron chain passing thru one end of the boat, and thence to a pier,

will, in the space of one minute, throw out the boat at right angles, and, in another, after the vessel has passed thru, by reversing the revolutions of the drum, bring it back to its place.

This novel contrivance, the only one of the kind ever invented, or at least the only one ever put in operation, it is believed, was, at first, the offspring of a necessity. The Legislatures of Vermont and New York, jealous of the rights of the people navigating the lake, refused, at that time, to grant the privilege of bridging the lake, except on the condition that three hundred feet in width of the channel be left open, or be made to be opened, for the passage of vessels. No draw bridge could be constructed to open to such an extent; and hence arose the great desideratum of some contrivance to ensure the continuous line of rails across the lake, so as to obviate the damaging necessity of breaking up the trains on the lake shores, and resorting to ferry boats for the transit of passengers and freight. And that desideratum was, after some experimenting at length fully realized in the construction of the present boat bridge, which has now been for about ten years in successful operation, having, during the whole time, led to no accident and no important detention of the trains. This invention—for such it truly was—mainly originated in the active brain of Henry R. Campbell, the noted master bridge builder of the Vermont Central and Vermont & Canada line of railroads, who, acting on the suggestion of the late Governor Paine, of the possibility of constructing some floating craft into which the cars could be run, and then passed over the unbridged part of the lake, went to work, perfected and put in operation the remarkable contrivance which has so often elicited the surprise and admiration of the visiting tourists. And few who carefully inspect its simple but efficient machinery, and witness the facility and exactness of its working, will fail to pronounce it an achievement which does honor to the projector."

The necessity for a competing route was soon felt and as a result the Portland and Ogdensburgh railroad was built to some extent, the New York State portion never having been completed. The intention was to build a railway line from Portland, Maine to Ogdensburgh, New York using lines already in existence insofar as possible. Naturally, the Central Vermont and the Northern New York railroads opposed the idea with every possible effort. Despite this opposition rails were laid as far as the draw bridge, to the north of the existing C. V. route. These rails extended, after crossing the C. V. at West Alburgh, on piling and bridging, some of which are still to be seen. Failing to obtain permission to use the existing bridge, as well as failure to get a charter from the State of Vermont, which at that time was very partial to the C. V., caused virtual abandonment of the project. Thus on January 31st, 1880, when the St. Johnsbury & Lake Champlain railroad company was organized to take over the Vermont Division of the Portland & Ogdensburgh railroad as well as other activities, the last threat to the Rouses Point bridge passed into history. The Northern N. Y. Railroad later became the Ogdensburgh & Lake Champlain railroad and subsequently the O. & L. C. division of the Rutland railroad.

During all this time the C. V. has continued to own the structure, the burden of maintainance however, rests on the Rutland.

About 1880 the old type bridge above described was removed and a timber draw bridge, operating on a center pier was installed. This bridge was a Howe type swinging draw with a high central tower, over which two inch iron rods with turnbuckles passed to each extremity of the truss. The bridge was operated by manual labor in the following manner. On the center pier bed was a large wooden gear of laminated oak securely bolted to the framing. A pinion gear, much smaller in size attached to a pinion shaft with a square socket end, and attached to the draw bridge, operated the structure. Two or more men, using a hardwood lever inserted into the squared end of the pinion shaft walked around on a platform in the center of the span and by this means, in the space of five to ten minutes, depending on the wind and other conditions, could fully open the draw. The main framing of the structure was 8 x 18 inch timbers, lapped and spaced with packing blocks, the whole assembly held together with iron rod ties and bolts.

In the early 1900's the Rutland began to acquire much heavier locomotive power and it was decided that the old timber bridge would have to be replaced with a steel one. The American Bridge Company of New York installed the present structure during the period of closed navigation in the winter of 1905-1906. This bridge swings on a center pier, is 213 feet in length with a central tower containing the engine for opening the draw.

The engine for operating the draw is rather unusual in character, and I feel that a description of this unit would be of some interest. The engine, built and installed in 1906 is a 15 horsepower Fairbanks-Morse gas engine which you light with a match. It will not run otherwise, as was proven some years ago. The old engine tender died and a new man was sent to take his place. The location of the metal box in which his predecessor had kept the old type 'stick' or phosphor matches was not established by considerable search. The new type matches were tried without success, even with the highest test gasoline obtainable. All sorts of attempts were made to start the engine without matches, but to no avail. There is only one way to start that engine, which to a casual examination looks like any other gas engine, except it is larger than the present one cylinder engines of similar H. P., and the fact that in the center of the cylinder head is a brass plunger-like device about six inches in length. The operation is this, first, unscrew the brass plunger, break off about an inch of a stick match and place it in the match slot, the plunger piston being extended. On the plunger piston is a piece of sandpaper-like substance, so that when the piston plunger is struck and forced into the plunger the abrasive will ignite the match. The plunger is now screwed into the cylinder head. Next about a cup full of gasoline is poured into the priming cup on top of the cylinder, the valve opened and the gas thus poured into the cylinder, the valve again being closed. At the side of the engine is a hand-operated pump, similar to a tire pump but somewhat larger. The next

step is to grasp the flywheel of the engine with the left hand and hold it so that it cannot rotate, while with the right hand the air pump is operated until pressure is built up in the engine cylinder. You then reach down and close the valve in the pipe from the air pump to the cylinder, meanwhile holding tightly on the flywheel so that it cannot turn. The final step in the process is to yank the flywheel toward you, and, at the same instant, with the flat of your hand, strike sharply on the end of the brass piston plunger containing the match. There will be only a second of indecision as to whether or not 'she will start,' since, 'if she does,' the resulting explosion will be heard some distance even in a thunder storm. If 'she' doesn't, you simply repeat the process until 'she does'. Fortunately, and despite 'her' years, 'she' usually 'does.'

Space does not permit the telling of the many interesting events that have taken place on the structure. However we must take space enough to remind our readers that on July 1st, 1851, the world's first refrigerator car, containing 8 tons of iced butter for Boston from Northern New York, made its initial run over the sturdy timbers. Despite the fact that the bridge has been in use since 1850, and the fact that the entire structure is exposed to the fury of strong winds, a ten foot rise of water level and huge fields of heavy ice, and further that during its entire existence to date two railroads cross it on two separate sets of rails within each other, no serious accidents, and few accidents of any kind have resulted. The 'luckiest' of these accidents happened on April 2nd, 1920, when Rutland engine, a heavy Mikado, No. 33, slid into the cold waters of the lake west of the draw. Even though the water was very cold and completely covered the engine, the six men who were in the cab escaped with only a wetting. They were, engineer Norman Gourtin, conductor Jack Vincent, fireman Guy Rice, brakeman Charles Chevalier and Clyde Moore and the Rouses Point 2nd trick operator (on his way home to Alburgh, Vt.), Bill Blaney. Another lucky accident was the night Phil Duffy, brakeman, tripped over a bell cord atop a freight train and fell into the icy lake. No one knows how he ever managed to climb to the top of an old piling stick coated with ice, but he did, and had to be chopped loose when his yells attracted the attention of his crew as the van went by.

In the past I have spent a considerable time out on the bridge, watching the trains and boats go by. From rowboats with fishermen aboard, to fine yachts with gleaming brass, scows and tugs with barges in tow, lake boats, sailboats and speed boats, freight trains, milk and passenger trains, the changing clouds and waves, the cool breezes, the beautiful Adirondack mountains of New York to the west, the verdant hills of Vermont to the east, all combine to create the impression of a world apart. The present war has changed all that now. No more do the fishermen sit on the timbers and lure the elusive piscatorial inhabitants; no more do the Canadians boat thru the draw in pleasure craft. Special permission from the Central Vermont, and for good reason only, gives one permission to walk out on the trestle, where armed tenders await you. Last week the army, a great part of it from New

England, moved over the bridge into northern New York, proving again the importance of this span as a unit in the defense system.

The Rouses Point bridge may again one day assume some of the importance it once held in the nation's transportation system. The waters beneath it may again feel the thrust of a warship's prow, or, from the fleecy clouds above may come black, tubular engines of destruction, with the resultant ending of this unit in a blast of fire and doom, though we sincerely hope not. Whatever its future, its past is gone. Never again will the little O. & L. C. engine No. 1, John C. Pratt, step with her dainty tread out on the span, followed by her train of little toy-like cars, her brass gleaming in the summer sun, her polished wood and metal a blaze of light reflected, stepping, I say, a little Lady, at work under the tender hand of her engineer, "Old Hiram" Weeks. Sic transit gloria.

Locomotive Costs

What does a locomotive cost? Well, that depends. Generally a lot of money. Armed with a set of drawings and a handbook, the locomotive builder of today can tell you with reasonable accuracy. It was not so in the olden days. Then, locomotive builders built engines in lots, just the same as the manufacturer makes shoes or anything else. After he built them, he then had to sell them, sometimes at a profit, sometimes at a loss. They might or might not be best adapted to the road that bought them but the builder got his money so that he could pay his bills and start on another lot. This system gave way to the builder constructing locomotives on order and the present method is to have the railroad prepare the specifications, the builder constructing the order upon an agreed sum.

A few years ago when your Editor was going through the locomotive book of the Amoskeag Manufacturing Co., locomotive builders at Manchester, New Hampshire from 1849-1855, he found a set of figures in which the builder had evidently attempted to estimate the cost of building a locomotive. The figures apply to the cost of constructing one locomotive for the Grand Trunk Ry., ordered by Mr. C. S. Gzowski and delivered either in 1854 or 1855. There is no way at the present time of checking these figures, they should be taken for what they are worth but they form an interesting comparison to the cost of our modern locomotives that cost from $100,000.00 upwards.

Cost of One Locomotive—Grand Trunk Railway

Boiler—11365 lbs. boiler iron at 5.76c		$ 654.62	
Labor		355.15	
193 holes at 6c	$ 11.70	$1009.77	$1009.77
Cutting 636 staybolts at 1¼c	$ 7.95		
Labor	12.48		
	$ 32.13		
Tubes—195 brass tubes—1404 lbs.		$1238.00	
4 brass rails		18.66	
		$1264.08	$1264.08
Forgings—12245 lbs. iron forgings at 8c		$ 979.60	
1946 lbs. of bolts at 8c		155.68	
36 lbs. of square steel at 20c		7.00	
15 lbs. of German steel at 12½c		1.88	
		$1144.16	$1144.16
2 engine axles—1734 lbs. at 6c		$ 104.04	
2 engine truck axles and			
4 tender truck axles, 2495 lbs. at 5c		124.75	
2 Pcs frame—2274 lbs at 7½c		170.55	
1 Front Girt—277 lbs. at 12c		34.63	
1 Back Girt			
2 Parallel Rods and			
2 Connecting Rods, 619 lbs. at 7½c		46.42	

4 Jams—1014 lbs at 20c	202.80	
4 Steel Plate Sides—348 lbs. at 12½c	43.50	
4 Cylinder stays—411 lbs. at 7½c	30.82	
4 Crank Pins—319 lbs. at 7½c	23.92	
4 Low Moor Tyres—3296 lbs. at 12c	395.52	
Freight on the above	10.50	
	$1187.45	$1187.45
Brass Castings—1603 lbs. brass castings at 34.71	$ 556.42	$ 556.42
Castings—22108 lbs. at 3c	$ 663.24	$ 663.24
Trucks Wheels—4 Engine truck, 30" dia. at 15c	$ 60.00	
8 33" tender wheels at 16c	128.00	
Freight	12.00	
	$ 200.00	$ 200.00
Springs—Engine & Tender Springs	$ 169.80	$ 169.80
Copper Pipes—1 Main Steam Pipe 177½ lbs	$ 97.83	
Labor—brazing, etc.	8.45	
4½' ⅜" copper tubing at 40c	1.80	
4½' ⅝" copper tubing at 45c	2.03	
Supply pipes and labor	17.73	
1 set of Heating Pipe	11.39	
1 Dripper	3.87	
1 Exhaust Pipe	3.75	
Binding Hand Rails	2.50	
1 set of Feed Pipe	18.15	
Labor—brazing and binding	11.90	
Copper pipe connecting gauge cocks	.38	
Branch Pipe	44.55	
Labor on same	10.50	
	$ 234.63	$ 234.63
Dome—1 brass dome casing	$ 75.00	$ 75.00
Lumber—664 ft. White Pine for lagging at 2c	$ 13.28	
791 ft. Black Walnut at 8c	32.00	
475 ft. Ash at 4c	19.00	
42 ft. Oak at 4c	1.68	
Lumber for 1 tender	100.00	
	$ 165.96	$ 165.96
Brass Work—1 Whistle	$ 16.75	
1 Steam Gauge	27.50	
3 Gauge Cocks	5.00	
6 Cylinder Cocks	5.00	
10 Oil Cups	7.50	
2 Spring Balances	14.00	
1 Blow Off Cock	2.00	
1 Cylinder Oil Cup	4.50	
2 Trask Cocks	5.00	
1 Steam Gauge	3.00	
1 Water Gauge	9.00	
Brass Bands	14.50	
Labor—bending, etc.	1.00	
	$ 114.75	$ 114.75

Sundries—1 Fire Guard	$ .80	
1 Smoke Stack—200 lbs. at 12½c	25.00	
55 lbs. of wheel guards at 4¼c	2.34	
Glass in cab	2.80	
Setting same	1.22	
Fittings for boiler	9.00	
274¾ lbs. Russia Iron	34.34	
Labor covering boiler	20.00	
4 Rubber Springs—16 lbs. at 6c	9.60	
Boiler iron for foot board—762 lbs. at 5.76c	34.56	
	$ 139.66	$ 139.66
TOTAL COST OF ENGINE		$6915.92
Tender—1 tank—5100 lbs. at 8c	$ 408.00	
Labor—Stone and Ricker	986.83	
W. Gay	90.00	
Setting up one tender	700.00	
Painting	100.00	
Extra Work by Parker	63.59	
	$1940.42	$1940.42
Delivery—Freight to Lawrence, Mass.	$ 25.00	
Freight to Portland, Maine	$ 50.00	
Sawyer's time and expenses	77.07	
	$ 152.07	

The Boston

The First Locomotive on the Allegheny Portage

By George M. Hart

The Allegheny Portage Railroad, one segment of the system of canal and railroad between Philadelphia and Pittsburgh, was owned and operated by the State of Pennsylvania from 1834 to 1857. It extended from Hollidaysburg to Johnstown, Pennsylvania, a distance of thirty-six miles over the Allegheny Mountains, which included ten inclined planes and "levels" between them. The line was first used with horses at the opening of navigation in the spring of 1834, but it was not until the second year of operation, however, that locomotives were employed as a means of motive power.

Samuel Jones, Superintendent, by resolution of the Board of Canal Commissioners, dated April 22, 1834, was authorized to contract for five locomotives for use on the road at the opening of navigation and the second track in 1835. Jones visited a number of builders at the time, but ". . . owing to the great demand . . ." few firms were able to build locomotives within the time prescribed by the Commonwealth. In August, 1834, Jones made a contract with R. M. Bouton, of Mill Dam Foundry Company, for one locomotive named *Boston* which was the first received by the road. The remaining engines ordered in accordance with the first legislative authorization for motive power, were from Edward A. G. Young of New Castle, Delaware, and McClurg, Wade & Company of Pittsburgh.

A report of Samuel Jones dated November 1, 1834, states: "It is my intention to have two . . . engines made at Pittsburg, and shall as soon as convenient, have one of those now making, carried to that place [Pittsburg] to serve as a model." The *Boston* was accordingly sent to Pittsburgh at the expense of McClurg, Wade and Company shortly before the close of navigation in 1834. The locomotive was returned to Johnstown about the 28th of March 1835, but it was not until September, 1835 that McClurg, Wade and Company had completed their engine named *Pittsburg* chiefly because of the difficulty in obtaining materials. It was the first locomotive built west of the Alleghenies, and ". . . constructed in all respects like the *Boston.*"

The *Boston* commenced running on the Allegheny Portage Railroad on May 10, 1835, on the "Long Level" of thirteen miles between the head of Plane No. 1 and the foot of Plane No. 2. The locomotive was capable of drawing 75 tons, on a grade of 20 feet to the mile equivalent to 12 loaded cars ascending and 24 loaded cars descending. The permitted maximum speed was 10 miles per hour.

During the first year of its use, the *Boston* ran for 174 days, and travelled 52 miles a day. The running expense record is as follows:

Engineman	174 Days at	$2.00	per day
Fireman	174 Days at	1.12½	per day
Coke & Wood	174 Days at	2.50	per day
Oil	174 Days at	1.00	per day
Tallow, Hemp, Lead, &c		.50	per day
		$7.12½	per day

or at a rate of thirteen cents, nine mills per mile.

The locomotive weighed only eight and one-half tons without fuel or water, and had 8x16″ cylinders, and a rated boiler pressure of 125 pounds. The 48″ driving wheels were made with wooden rims and iron tires. The engine cost without tender, $6,996.77 when delivered ". . . on the wharf at Boston . . . ," and the cost of transportation to the Allegheny Portage Railroad was $223.25, including $41.25 for alterations at Pittsburgh during the winter of 1834-1835.

The Young engines named *Delaware* and *Allegheny* commenced running on the same day as the *Boston,* but both had broken down within two weeks of use. Consequently, the *Boston* did almost all the hauling done by locomotives the first year they were operated, and lost only two and one-half days for repairs costing $17.00.

The final disposition of the *Boston* is not known. The last record appears in 1845 when it was noted the boiler and flues were worn out.

Watching the Trains Go By

By George H. Latham, Wilmington, Dela.

Courtesy L. & N. Magazine

"B. & O., C. & O., Old North Western, L. & N.—
Let me wander back in fancy, see their speeding trains again,
N. C. St. L., N. & W., Southern and Virginian, too—
Pull the bell-cord, blow the whistle, bring me back the dreams I knew!"

I am a grown man getting along toward middle age. Many of my childhood enthusiasms have faded as my thoughts and activities have so largely been directed towards earning a living. But one of the thrills which have never faded, whose memories have their pristine freshness, is watching the trains go by.

I suspect that a great many grown-ups secretly harbor a love for the old steam engine and "the cars," though the unfortunate American custom of hiding one's emotions and of appearing *blase* and sophisticated keeps them from admitting it to anyone except, perhaps, a few kindred souls. Not long ago I was agreeably surprised when one of my middle-aged friends confided to me, "Every now and then I take Richard to see the B. & O. trains pass, and I let him think I'm doing him a big favor, but I get about as much kick out of it as he does." This friend of mine was, some years ago, a ticket agent and occasional dispatcher on the C. & N. W. out in Nebraska, and his father was a lifelong dispatcher on the same road.

My interest in trains and the shining rails is no doubt both inherited and acquired—inherited because my people have been railroad-minded for years, and acquired because I have been around trains and railroad people all my life.

My grandfather was general freight agent for the Orange & Alexandria Railway before, during and after the Civil War. My father was a shipping clerk for that road after he was mustered out of the Confederate Army. In the eighties he was chief engineer of the Costa Rican Railways, which he built for Minor Keith, who did so much to develop Central America. About ten years ago, Ramsey Macdonald, after travelling over this road (which is practically unchanged after all these years), remarked that it is an eighth wonder of the world. Later, my father was chief engineer of the British Railways in Jamaica, British West Indies. Retiring in 1896, he returned to America, living alternately in Richmond, Va., and Louisville, Ky., and spending the summers at Crozet, Va. In this little village among the Blue Ridge Mountains, I used to spend hours, as a child of five, watching the C. & O. trains. Well I remember the canary-yellow passenger trains flying by as we children stood on the whitewashed fence and waved at them. Some of my earliest memories are of riding those trains when we returned to the city in autumn. I have always had an especial affection for the C. & O. because of those early associations. Sometimes when I

see an old C. & O. locomotive doing switching duty or rusting away her old age in some railroad yard, I wonder whether she was one of those I used to watch going by at Crozet.

After my father's death in 1910, I went to school in Nashville, Tenn., living with a cousin, Theodore Speiden, and his mother, father and sister, who made the most nearly ideal family I have ever known. At the time Mr. Speiden, about thirty years of age, was roadmaster on the L. & N. A few years later he became general manager of the N. C. & St. L. I spent many an hour (too many for the good of my studies, I fear) after school and on Saturdays in the Big Union Station watching the trains come and go. Aristocrats of the rails like the "Dixie Flyer" whose arrival and departure always created a furor. Humble little trains pulling out unobtrusively when the golden afternoon sunlight would stream in the big smoky trainshed—the "Lebanon Express," the "Tullahoma Accommodation"—little three-car trains pulled by small out-of-date Atlantic locomotives, carrying plain country people back home from a day in the city—back through sun-bathed fields and woods, over the beautiful Cumberland River, into the lengthening shadows of the rolling hills, to homes where bright-eyed children waited for a toy or a tidbit.

Those L. & N. people were the most enthusiastic and loyal employes I have ever seen. Mr. Speiden's whole life was wrapped up in the road. He worked early and late and usually several hours on Sunday as well. I remember one of the men in the Division Superintendent's Office named his first little girl, "Ellen N. C.—" after the railroad.

In memory, I can see them all in the large grimy offices above the Union Station, with the music (some call it noise) of the railway terminal all around them—the clanging of engine bells, the "chuff, chuff, chuff" of locomotives, the burst and hiss of steam, the clatter of strings of cars being shifted. Nowadays one misses the sound of the locomotive bells in the big cities, owing, no doubt, to anti-noise ordinances which yet have not got around to curbing indiscriminate automobile horn blowing. The engines around these parts have electrically operated bells which ring too rapidly and too mechanically. They somehow lack the musical timbre and cadences of the old hand-operated bells, which rang slowly (sometimes turning completely over) and had a mellow, rich tone that was really musical.

When we settled on the farm near Culpeper, Va., about 1902, I saw a great deal of trains. The Southern Railway ran two miles to the east, and from our hilltop home we could see the trains passing day and night. Somehow, even at that distance, they seemed companionable, connecting links with the great world, especially at night when all was quiet and, lying snugly in bed, we could hear their musically mournful, long-drawn-out whistles far away. Sometimes we enjoyed the novelty of riding the locals to the county seat, but we usually rode in the family carriage. When with my father I rode the "milk train" to Manassas about 1905 to see a re-enactment of the Battle of Bull Run, it was the train ride rather than the sham battle which I remembered most.

On the farm, the Negroes used to keep track of the time by the trains. They knew them all by number and the times they passed by. "Ole 29 comin' down the line," they'd say, or (referring to the afternoon C. & O. express), "Gittin' late; ole yaller dog ridin' de rails."

Memories of college days, too, are inseparably associated with trains. Did they not take me away from home on golden September days when I was loath to leave? Did they not take me happily back again for the Christmas holidays and in June? And didn't we boys often hike long distances Sunday afternoons along the N. & W. and the Virginian tracks, through the wild, rugged mountains of southwest Virginia, stepping aside to let the long coal trains pass with their big Mallets barking out their exhausts to the echoing hillsides? And often, taking my turn at sentry duty, I have walked alone in the clear frosty nights when the only sounds were the distant whistles of trains and the slow beat of their exhausts as mighty engines labored over the grades with their heavy loads of coal. Companionable, comforting sounds, those, yet infinitely melancholy and memory-provoking.

And so it is that whenever I hear a distant train whistle, no matter where, memories come to me of old days, old folks, old friends; pleasant but pensive memories always. I am grateful to the trains that it is so. And as I listen, a strange nostalgia, a sort of wanderlust, a vague melancholy, steal over me. Always I think of the men out yonder on those trains, of the dispatchers, the roundhouse workers, the section gangs—all the men who make it possible for those trains to run so smoothly and safely. I have always thought I would like to be one of them, doing useful work of the world, traveling, eating, sleeping, living, always among the sounds and sights and odors of the railroads.

Editor's Note:

"Watching the Trains Go By," by George H. Latham appeared not long ago in the L. & N. Magazine. It so reflects the thoughts and moods of so many of us that it has been reproduced in our bulletin. The majority of us view the passing of a fast passenger train or long freight with quickening pulse and if the passing is accompanied by a series of musical notes from the chime whistle, our happiness is complete. To those who live some distance from the right of way the whistle brings the thought that here is our contact with the rest of the world—we rest a bit easier in the knowledge that trains use those tracks.

One of our American railroads which has capitalized the use of the locomotive whistle is the Louisville & Nashville R. R. Daily except Sunday, the whistle of the "Pan American" is broadcast through station WSM—Nashville, Tenn. as the train approaches that city. Show me a real railroad fan whose pulses won't quicken when the operator announces—"Here comes the Pan American" and you hear the two long and two short blasts followed by the click of the wheels over the crossing.

Yes, whether it be a passenger or a freight, a suburban local or a work train, we involuntarily stop to note their passing.

Worth Reading

(Compiled by Elizabeth O. Cullen, Reference Librarian, Bureau of Railway Economics, Association of American Railroads, Washington, D. C.)

BOOKS AND PAMPHLETS

An Act to amend the Act to Regulate Commerce, approved February 4, 1887, as amended, so as to Provide for Unified Regulation of Carriers by Railroad, Motor Vehicle, and Water, and for other purposes. Public—No. 785—76th Congress. Approved September 18, 1940 66 pp. Washington, D. C., Superintendent of Documents. 10 cents. ". . . this Act may be cited as the Transportation Act of 1940 . . ." p. 1. Summary, under title: *Transportation Act of 1940*, by Transportation and Communication Department, Chamber of Commerce of the United States, Washington, D. C. 16 pp. Single copies available on request.

A Brief History of the Richmond, Fredericksburg and Potomac Railroad, by John B. Mordecai. 98 mimeo. pp. Illustrations, Maps, Facsimiles. Richmond, Va., The Author, who is Traffic Manager of the R. F. & P. "Dated at Richmond, Va., February 25th, 1940, being the 106th Anniversary of the incorporation of the Company." Foreword.

The Economics of Transportation in America—The Dynamic Forces in Development, Organization, Functioning and Regulation, by Kent T. Healy. xviii, 575 pp. Illustrations, including maps, diagrams. New York, The Ronald Press Co. $4.00. "Geographically-necessitated transportation" pp. 41-48. "List of Railroad Histories" pp. 559-561 is a list of citations to Interstate Commerce Commission corporate histories, arranged alphabetically by railroads.

History of the Western Maryland Railway Company, Including Biographies of the Presidents—Revised Edition, by Edward M. Killough. 128 pp. Illustrations and Maps. Baltimore, Md., Western Maryland Ry. Co. The author is Valuation Engineer of the Company. "Originally chartered as the Baltimore, Carroll and Frederick Rail Road Company in 1851 . . ." p. 1.

Indebted Railroads—A Problem in Reconstruction, by E. G. Campbell. pp. 167-188, Reprinted from The Journal of Southern History, May 1940. ". . . without the help of the government railroad reconstruction in the South inevitably would have been retarded even more than it was . . . Against the general background of hate and irreconciliability which characterized the Reconstruction Congresses, the termination of the indebted railroad problem offers a welcome contrast . . ." p. 188.

The New York Air Brake Company—Fiftieth Anniversary, 1890-1940, by The New York Air Brake Company. Cover-title, [36] pp. including Illustrations. New York City, The New York Air Brake Co. ". . . . During its span of life and that of its predecessor, the Eames

Vacuum Brake Company, men have learned to control with safety the movement of railroad trains . . . were it not for advances in the art of air braking, the present day 100-mile-per-hour passenger schedules and 150-car freight trains would not be actualities on the country's railroads . . . " p. 6.

QUIZ on Railroads and Railroading—400 Questions—400 Answers, by Association of American Railroads. Cover-title, unpaged. Illustrated. Washington, D. C., Association of American Railroads. Available on request. Questions numbered. Index following foreword.

The Railroad in Literature—A Brief Survey of Railroad Fiction, Poetry, Songs, Biography, Essays, Travel and Drama in the English Language, Particularly Emphasizing Its Place in American Literature, by Frank P. Donovan, Jr. 138 pp. Illustrations and Folded [Railroad] Literary Maps of North America, the British Isles, Europe, Asia, and Africa.

The Railroads' Relationship to National Defense, by M. J. Gormley. 8 pp. Washington, D. C., Association of American Railroads. Available on request. His address to the Northwest Shippers' Advisory Board, Duluth, Minn., July 25, 1940, which is also printed in the Board's proceedings of that date, pp. 25-26. "The railroads are always in a state of national defense and, in fact, they are the only organization that has that distinction . . . " p. 3.

Railways of the United States—Their Plant, Facilities and Operation, by Bureau of Railway Economics, Association of American Railroads, Washington, D. C. 48 pp. Its Special series bulletin No. 69, April 1940. "The statistical tables and charts . . . show the development of the steam railways of the United States during recent years . . . The technological progress of the railway industry is outlined, with an indication of the general trend of railway employment . . . " p. 4.

White Water and Black Magic, by Richard C. Gill. xiv, 369 pp. including illustrations of the country shown in the end-paper maps. "Most of this book is concerned with the way curare has bridged the gap between the smoke-blackened clay pots of the Amazon tribesmen and the alembics of the modern scientific and medical laboratory . . . " Preface, p. ix. Transportation as it is effected on the railroads and rivers and trails is described in detail, while how *not* to write about railroads unless you know they've been built is mentioned on page 81.

Who's Who in Railroading in North America, 1940 (Tenth) Edition. 716 pp. New York, The Simmons-Boardman Publishing Corporation. $7.50. ". . . It includes in addition to railway officers, leaders in the railway supply manufacturers' group, railroad labor leaders, regulating authorities—both state and federal, transportation economists, specialists in railway finance, educators concerned with railroad problems, I. C. C. practitioners, consultants, authors, editors, etc. . . . " p. 3.

Articles in Periodicals

Address, by Robert V. Fletcher. New England Shippers Advisory Board. Proceedings . . . Bretton Woods, N. H., September 12-13, 1940, pp. 19-23. " . . . I have become quite thoroughly convinced that we in America here are deeply interested in the transportation problem, rather than a railroad problem, or a truck problem or a bus problem or an air problem or a water transportation problem. We have got to solve this problem as a whole . . . " p. 20. " . . . We have had a number of epoch-making Transportation Acts . . . Now we have the Transportation Act of 1940 . . . I do not think that overnight this Transportation Act is going to solve all of the problems to which the railroads or any other transportation agency is subjected, but I think it gives an indication to the country that Congress, for the first time, . . . is legislating about transportation agencies as a whole . . ." pp. 20-21. ". . . I am particularly pleased and quite enthusiastic about another provision of this law, commonly known as Title III, which provides that the President of the United States shall appoint three men to a Board of Investigation and Research. . . . I wonder if you all apprehend how sweeping that language is and what a task these gentlemen have . . ." p. 22.

Discarding from Weakness, by Robert S. Binkerd. Atlantic Monthly, August 1940, pp. 205-211. ". . . Abandonment of unprofitable mileage is a constructive—not a destructive—move . . . . . current railroad receiverships and trusteeships provide a fortunate opportunity for 'discarding from weakness' in the forthcoming reorganizations . . ." p. 211. Also reprinted. [7] pp.

Freight Progress Number. Railway Age, May 25, 1940. Its Vol. 108: 879-962, and 249 advertising pages carrying out the theme of this special number, including Illustrations and Maps, partly in colors. ". . . Freight trains at passenger train speeds, overnight deliveries at points as far as 500 miles distant, perishable trains that cut days from former schedules—all these have shrunk the transportation map of this continent materially in the last five years and have brought the jobbing, producing and consuming centers much closer together . . The amount of research and study devoted to this end by the railways and the railway supply manufacturers . . . is stupendous in its scope. . ." p. 885.

General Transportation Conditions and Railroad Preparedness, by Arthur H. Gass. New England Shippers Advisory Board. Proceedings . . . Bretton Woods, N. H., September 12-13, 1940, pp. 13-15. ". . . We have recently gone through a test as to our ability to handle troops . . . The First Army's maneuvers were at Canton, New York. The Third Army's maneuvers were at Crovens, Louisiana. The Fourth Army had their maneuvers at Little Falls, Dakota, and at Centralia, Washington. In a three-day period we put 105,000 men into those camps by rail without the disturbance of a single piece of commercial traffic. There was not a single train cancelled and there was no annulment of any freight trains. A week later we put 40,000 men into the Second Army maneuvers in Wisconsin. In addition . . . we had to keep their supplies

going forward with them. It was built up in a continual movement, so that the men and their supplies were not separated at any time . . . " p. 14.

La Ruta Interoceanica a traves del Peru, by Carlos Ontañeda. Boletin de la Asociación Internacional Permanente, Congreso Sudamericano de Ferrocarriles, Buenos Aires, Argentina, May-June 1940, pp. 13-22. Revives discussion of the proposed Marañón Railway from Belem, Brazil to Eten, Peru, with historic background, and analysis of present-day transport requirements, and the facilities now available.

Transportation Services and the War . . . Railway Gazette, London, England, in each week's issue. A reminder that this survey continues, including as the war spreads, data on the latest available developments in various parts of the world.

What Is New In Railroading? by Allanora A. Shantz. The Quotarian, May 1940, pp. 2-3, 14. Illustrated. ". . . The railroads . . . coined a new word for the new equipment they were building, until now 'streamline' has become the trade-mark for the latest and most modern thing available, whether it be an engine or a corset . . ." p. 2. ". . . While the male contingent was clamoring for more speed, the women were demanding more beautiful and artistic interiors . . ." p. 2.

Word Warfare in Transport, by Frank Pick. Journal of the Institute of Transport, London, England, July 1940, pp. 143-147, ". . . I want to talk about the new words . . . 'prestige' [with comment on statistics and their uses] . . . 'co-ordination' . . . 'reasonable' . . . 'rational' . . . 'rationing' . . . 'square deal' . . ."

New Books

THE RAILWAY HANDBOOK, 1939-1940. London: The Railway Publishing Co., Ltd., 33 Tothill St., S. W. 1. 8½x5½ in. 96 pages, paper covers. Price 2 sh 6 d. This handbook is designed to provide the student with a concise collection of useful statistics and other information. The same sequence used in the previous five editions has been followed but all matter has been revised and brought up to date. The chronology of railway history has been extended to include items of outstanding importance and this may be gauged from the fact that the Railway Executive Committee, appointed by the Minister of Transport to be his agents for controlling the railways, is included. The usual census of railway employees is not included this year but, through courtesy of the Minister, the figures for the week ending March 11, 1939 are included.

THE RAILROADER, by W. Fred Cottrell, 145 pages, 7⅞x5¾ inches. Bound in cloth. Published by Stanford University Press, Stanford University, California. Price $2.00.

This little book is a study of how the occupation of railroading affects the lives of the railroad man and his family. The author comes from a railroad family—his father worked continuously until his retirement, his brothers are railroad men and his sisters married railroad men. He was brought up in a railroad town and he started his railroad career at the age of fifteen. With this background the author recites the facts as he finds them—he neither condemns nor does he condone but whether the reader likes it or not, the facts stand out. The author has stressed the fact that the railroader has many relationships other than those that are strictly occupational and his concern has been the social relationships of the worker off the job rather than the physical conditions on the job. A glossary of railroad language is a valuable addition to the book. All told, the author has touched upon a new and interesting viewpoint of the railroad man, his family and his life in his community and has done it very well.

EARLY BRITISH LOCOMOTIVES, by C. F. Dendy Marshall, 103 pages, 11x8½ inches, illustrated. Published by The Locomotive Publishing Co., 3 Amen Corner, London, E. C. 4, England. Bound in paper, price $3.00; bound in cloth, price $3.75.

In this book the author has set forth his researches of the past eleven years since the publication of his "Two Essays in Early Locomotive History." Quite a bit of new matter has been added which is of great interest and value. The first chapter is devoted to Trevithick and the next chapter is devoted to the Blenkinsop engines. Chapter III offers evidence of a locomotive at Whitehaven in 1812 and contains a number of drawings of Chapman's chain engine of 1813. The fourth chapter gives new light on the engines of George Stephenson, the fifth is in the nature of a supplement of the work—"A Century of Locomotive Building", by J. G. H. Warren and includes the acount of the

mysterious Whistler engine, built for the Baltimore & Ohio R. R. in 1829, the vessel carrying the locomotive was wrecked. The last chapter contains notes on all other men who built locomotives up to 1831. The author, one of our members, needs no introduction as to the merits of his work and the care and pains which accompany his efforts in the fields of research.

MEN, STEAM AND THE DRIVEN WHEEL, by Edward Yeomans, 173 pages, 8x5½ inches. Bound in cloth. Published by The Tuttle Publishing Co., Rutland, Vermont. Price $1.50.

What makes the wheels go round? In this book, the author tries and has succeeded in making the locomotive a live personality. Throughout the entire book the author applies his own philosophy—that there is a "deus ex machina" which is revealed in the pattern maker, the molder, the caster, the forger, the driller, the riveter, the machiner, the assembler and the operator. The book is a most orderly narrative giving briefly something of the history of the locomotive, then its construction, the accessories such as stokers, superheaters, boosters, power reverse gears, etc, then the assembling of the locomotive. Other chapters touch on roundhouse and terminal maintenance, the men in the cab and the locomotives of today. The author should be congratulated in producing in brief form a most interesting and valuable book that is bound to be of interest to those that are interested in the "Iron Horse."

CAVALCADE OF THE RAILS, by Frank P. Morse, 370 pages, 9½x6¼, illustrated. Bound in cloth. Published by E. P. Dutton & Co., Inc., New York, N. Y. Price $3.75.

Here is a book that carries us from the "Stourbridge Lion" to the Diesel locomotive but the author has placed us in the latest streamlined, air-conditioned equipment and carried us at express speed over the most scenic route of American railroad history. There is enough of the history to make an interesting flavor, enough of the personalities to furnish the spice and these are mixed in with the facts to produce a most readable and interesting history.

We see the roads struggling westward from the Atlantic seaboard, the Baltimore & Ohio, Charleston & Hamburg, Mohawk & Hudson, Pennsylvania—we go to the south with the little Pontchartrain, we come to New England with its score of small roads, we follow the ramifications of the Erie, we follow the efforts in the mid-west and then we are transported to the construction and completion of our transcontinental systems, the Union Pacific, Central Pacific, Santa Fe, Northern Pacific, Great Northern and others.

The box car and Pullman, automatic coupler and latest signal devices are all treated in interesting fashion. If you want to sit up half the night then your reviewer suggests you purchase a copy of this book.

BUILDING THE CANADIAN WEST, by James B. Hedges, 422 pages, 8⅜x5½. Bound in cloth. Published by The Macmillan Co., 60 Fifth Ave., New York, N. Y. Price $4.00.

Canada and its railroads, their history and their development have been the subject of some recently well conceived and well written books. This book is a study of the land and colonization policies of the Canadian Pacific Ry., and a comparison is drawn of our American methods with that of our northern neighbor.

As time passes, information appears in print of the land policies of our American railroads. In this country, that of the Illinois Central served as a pattern for many of our western trunk lines. But no matter whether it was the United States or Canada, the best and most fertile land would have been worth but little without some means to transport the harvest—the railroad. To build into this vast wilderness took not only courage, vision, capital and skill—it required assistance in the shape of land subsidies. The administration of these land grants depended upon the stipulations under which they were granted and human nature. Since the latter has not changed a great deal since the days of Adam and Eve, the strictness of the former was increased as time went on. But no matter what we may think of the past, the author in this book has presented a clear cut and interesting picture of what has always been recognized as an ably managed and outstanding corporation—The Canadian Pacific Railway, and the part it played in colonizing the Provinces of Manitoba, Saskatchewan and Alberta. Whether the Canadian Pacific Ry. was built twenty years too soon, whether its land grant was too large, these are simply matters of opinion. Construction of the road could only be acomplished in part by these land grants but construction of the road was the means of settling and developing the great Canadian north-west. One must consider the building of subsequent Canadian railroads in that section in the light of present day circumstances. To those of us who are interested in the railroad history of our northern neighbors, this book is certainly well worth owning.